tower, can be defrayed. Subscriptions for the new church were at first set on foot by Mrs. Salvin, wife of the late vicar, who gave 200*l.* towards the object in view, and the Lords of the Admiralty, who are patrons of the living, gave 500*l.* Parishioners and others have subscribed very liberally.

Stoke Poges.—The chapel of ease at Holly Bush Hill, in this parish, has been re-opened after an enlargement and restoration. The chapel was originally built for and used by Dissenters; but some little while before the death of the late vicar, the Rev. John Shaw, it was found by them so unnecessary, that the owners offered it to him for purchase, and it was forthwith bought, and licensed, and used for evening services in its original state. Soon after the present vicar succeeded to the living the building was considerably enlarged, and open seats substituted for the former pews; but the work of the last few weeks has changed the character and appearance of the original Dissenting Chapel. A chancel, with triple lancet windows, has been added, a new open wooden roof has been raised upon the old walls, a west window inserted, an entrance-porch built, and a bell-turret erected. The entire work has been executed by Messrs. Knight & Sons, builders, Stoke Common.

Little Cowarne.—The parish church of Little Cowarne has been re-opened, after restoration. The church, which is of very ancient date, and is united to the living of Ullingswick, consisted, prior to its restoration, of nave and chancel, with western tower, which, if it had ever been carried up at all, had been reduced, at some time longer ago than memory goes, to the level of the nave. The rafters of the roof of the nave were so decayed that the easternmost half, for about 17 ft., had been taken off quite short, and put on at a lower pitch, which gave the church the appearance somewhat of consisting of three short chancels, the western portion of the nave being the highest, the remainder something lower, and the chancel roof lower still. The nave was a thirteenth-century building, but all the windows excepting one had given way to square openings, the original dressings having probably been built into the nearest wall. No trace, however, was left of them so far as was visible, though when the wall came to be pulled down the workmen came upon the portion of the head of a window, which established the fact at once,—that the building was of the thirteenth century. The chancel was probably of even an earlier date than that. There was, at any rate, a small lancet window on the north side—and still is—which is early Norman, though whether it occupies its original position or not is questionable. The entire building being in a ruinous condition, its restoration was contemplated as long ago as ten years, Mr. F. R. Kempson, architect, of Hereford, having been employed to survey the church and to prepare plans for its restoration in 1860. But nothing was done for a long while from the difficulty of raising funds. At last it became peremptorily necessary that something should be done, the roof or greater part of it having fallen in. The matter was then taken up again, and the modest renovation which has now been carried out was resolved upon. This consists of the entire rebuilding of the east and south walls of the chancel, and the rebuilding in part of the south wall of the nave, the opening out of the chancel, which was formerly separated from the nave by a very small and insignificant arch, and the substitution in place of the latter of a lofty arch nearly the entire width of the chancel. The tower also has been thrown open to the nave, and is divided from it by an arch corresponding in height and of nearly the same width as the tower itself. The latter has likewise been raised about 10 ft., and is surmounted by a saddle-back roof, having transverse gables on the north and south sides, in which belfry windows, with stone louvres, have been inserted. The windows on the north and south sides of the chancel, the lancet window on the north side of the nave, the porch archway, and the west window of the tower have all been preserved. A new three-light east window has been placed in the chancel and new windows are also introduced on the south side of the nave in character with the architecture of the period. The floors throughout have been laid with encaustic tiles of plain pattern from Mr. Godwin's manufactory at Lugwardine. The roofs are new, and are of red pine-wood; and the chancel has been fitted temporarily with deal seats and book-desks. Owing to the paucity of the funds there are no permanent benches or pews, the accommodation being met for the nonce by chairs and stools and a few very ancient benches, which must have been so used in the church for centuries. Neither, for the same reason, is there any pulpit—only a lectern, which is made to serve the same purpose. The work has been carried out by Messrs. Morris & Bufton, of Ocle Pritchard, the architect being Mr. F. R. Kempson, of Hereford and London. The actual cost of the restoration is 500*l.*, of which sum 300*l.* have been raised.

Hadleigh.—Many hundreds of pounds have been expended within the last few years in restoring the exterior and interior of the parish church, and an effort is now being made to substitute open benches for the present high pews. The rector (the Rev. R. T. Wheeler), presided recently at a public meeting in the town-hall, to which all classes were invited. Mr. Wheeler stated that his curate's brother, Mr. Valpy, an architect, had that day kindly surveyed the church, and taken great trouble in making a report, which showed that the cost of the work necessary to be done would be somewhere about 1,100*l.* He announced that the Rev. Hugh Pigot, a curate at Hadleigh, had promised to present the church with a new pulpit, in memory of the late rector, the Very Rev. H. B. Knox. He concluded by stating that he should head the subscription list with a donation of one hundred guineas, an example which was immediately followed by Mr. Joseph Rand. Mr. William Grimwade put his name down for fifty guineas, and Mr. Robinson followed with a similar amount. Mr. Hardacre gave thirty guineas, and then followed numerous smaller sums, the total athount promised at the meeting being 665*l.* 18*s.* 6*d.* Mr. Wheeler invited ladies to take subscription cards, 137 of which were distributed. Letters were read from Col. Anstruther and Sir C. R. Rowley, expressing their readiness to add their names to the subscription list. The amount now subscribed is between 700*l.* and 800*l.*

Llanerfyl. (*Montgomeryshire*). — The parish church of St. Erfyl has been re-opened, having been re-built on the old site. The new church consists of nave and chancel, western bell-turret, vestry, and south porch. The old nave roof has been restored and refixed, and the font repaired and provided with a cover. Messrs. Maw & Co.'s encaustic and enamelled tiles have been used for the reredos and floor within the altar-rail. The open seats are of pitch pine. The chancel stalls, pulpit, lectern, and other fittings of oak are from the old church. The west window is filled with stained glass by Messrs. Done & Davies. Accommodation is provided for about 200 persons. The total cost of the building is 1,500*l.*, and the work has been executed by Mr. Morgan, of Llanfair Caereinion, from the designs of Mr. E. Haycock, jun., architect, Shrewsbury.

Little Marcle.—The new church dedicated to St. Michael, at Little Marcle, has been consecrated by the Bishop of Hereford. The body of the church consists simply of nave and chancel, after the manner of many of our small mountain churches; it has the additions, however, of a north porch and small vestry on the same side, and of an organ-chamber on the south side, as well as a bell-turret at the west end, containing three small bells. The style is Geometrical. The edifice is built of native red sand-stone, with Bath-stone dressings, the former, as well as the site, being the gift of Earl Somers, the stone, which is hard and durable, being quarried at Pixley, not far off. The architect has treated the building freely with Bath stone. The nave is 41 ft. long by 20 ft. 9 in. wide internally, the chancel being 20 ft. 3 in. in length, and narrowed to 18 ft. wide; the division between the two being effected by a pointed arch, carried upon circular shafts resting upon carved corbels. The roof of the organ-chamber is arched on the inside, and the vestry has an external doorway, fireplace, and window on the east side. The benches are of red deal, varnished, the chancel fittings being of oak, and the floor throughout is laid with Lugwardine blue and red tiles, laid in square. The several windows are glazed in alternate diagonal lines of white and green-tinted cathedral glass; but figured glass windows, the gift of the Rev. Osborne Gordon, rector of East Hampstead, Berks, are being prepared. The roofs are covered with Broseley tiles of red and blue. The whole work is executed by Messrs. Wall & Hook, of Brinscombe, near Stroud (who also carried out the restoration of the church at Preston, in this immediate neighbourhood), under the direction of Mr. J. W. Hugall, of Oxford, the architect.

Thetford.—St. Peter's Church has been under restoration for the last few weeks, and is now re-opened. The restoration and re-arrangement have been entirely confined to the interior. At the east end, the floor of the sanctuary has been raised two steps, space not allowing of more; and a modern door filled up which formerly opened almost on the altar-rails. The new floor and risers are laid with Minton's tiles. On the south side a carved oak sedilia is placed, and a carved oak credence-table, picked out with gold, on the north side. On this side a difficulty arose, owing to one of the aisle arches coming within a few feet of the east wall, and consequently leaving some portion of the sanctuary open on that side. The architect, however, has got over this difficulty by a little low screen of oak, studded with Mediæval diapers painted in the oak panelling. The walls both north and south are decorated with borders, texts, and symbolic devices. The sanctuary is shut off from the chancel by an oak rail, supported on standards. The east window was presented by Mr. S. C. Bidwell, also the cost of the painting above it. The tracery of the window is a design in the Perpendicular style. The glass which fills it is by Messrs. Ward & Hughes, of London. The upper part of the window is filled in with figured painting. The four lower compartments are filled with simple painted quarries. The church throughout, *i. e.*, chancel, nave, and aisles, has been re-arranged, and is now filled with open benches of varnished deal. In the chancel, where the choir sit, the seats have more elaborate bench ends, and have small sunk circles filled in with tracery of various patterns, and picked out with green and red. The front rows of seats have desks supported on iron standards, supplied by Messrs. Hart, who also supplied the new gas standards throughout. The carved oak lectern, executed by Messrs. Frank Smith & Son, of London, from a design by the architect, has been purchased with money collected by a lady. The large gallery at the west end of the church still remains, as the want of funds have alone prevented its removal. It contains the organ. Nearly thirty sittings have been gained in the body of the church by the new arrangement. The whole work has been carried out from the drawings of Mr. A. E. Brown, of London. The contractors are Messrs. C. Bishop & Son, of Diss, and Mr. R. Cornish, of North Walsham. The whole of the painted decorations have been executed from the designs and under the immediate superintendence of the architect by Messrs. King, of Norwich.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Holloway.—The "Church of the Sacred Heart," in Eden-grove, has been opened for divine service. It is in the Early Geometric Gothic style, and consists of a nave and chancel, together about 90 ft. long, with north and south aisles terminating in chapels dedicated to our Lady and St. Joseph. The westernmost bay of the north aisle is occupied by the tower, which is at present only partially completed. The structure is of brick throughout, the internal facings of the walls being lined with red bricks, relieved with bands of black, and stone dressings. The reredos and high altar will be of Caen stone and marble, and will contain statues of St. John and St. Margaret, with other sculpture in panels. The stained glass in the east window above, for which a design has been prepared by Messrs. Hardman, of Birmingham, under the direction of the architect, will be devoted to subjects illustrative of "the devotion of the Sacred Heart." The main columns of the nave and chancel arcades are of blue pennant stone, with floriated capitals, carved by Messrs. Farmer & Brindley, at the expense of a member of the congregation (Mr. Holland), who made the cost of the internal carving a special gift, in addition to his other subscription. Attached to the church and sacristy there are boys', girls', and infants' schools, with class-rooms adjoining, capable of receiving over 200 children, and a clergy-house containing accommodation for the pastor (Rev. C. J. Keens) and other two priests; while, in the basement, besides other rooms, there is a large kitchen from which it is intended to dispense soup and other necessaries to the poor during the winter months. The architect is Mr. F. H. Pownall, of London; and the works have been carried out under contract, by Messrs. Carter, of Holloway-road, builders (Mr. Jarvis

acting as clerk of the works), at a cost of between 6,000*l.* and 7,000*l.* The buildings form an effective group, facing the end of Eden-grove.

Stanningfield.—A new chapel has been opened here. Sir Edward Gage has erected, at his own expense, the chapel and school-room for the use of the Roman Catholics in this and the surrounding parishes. The chapel, built at the north end of the pastor's house, and in a line with it, is a plain little building. On the east side is a porch by which the chapel is entered, while on the opposite side, at the southern end, is the sacristy door, from which there is a private passage into the dwelling-house. Inside the chapel is as plain and unpretending as it is externally, but the state of the walls, which are not yet dry, prevents any attempt for the present at permanent decoration. It is lighted on each side by three two-light windows, while at the north end is a larger one of three lights, the altar being erected at the opposite end. The seats are the same as those used in the chapel at the hall, brought thence to do service here. The school-room, which stands just beyond the chapel, is built of wood, its dimensions being 30 ft. by 12 ft., and it will afford ample accommodation for the children generally attending it,—about thirty in number. The whole of the work has been executed by Mr. Pate, of Lawshall.

SCHOOL-BUILDING NEWS.

Sancton.—The foundation stone of Jackson's Memorial Schools has been laid in the village of Sancton, near Market Weighton. The new schools are to be erected on the site of the old one, on ground immediately adjoining the churchyard, from the designs of Mr. Charles Holt, of Bolton-le-Moors, architect (brother of the vicar), and are estimated to cost nearly 350*l.* Mr. John Porrill is the contractor for the woodwork, and Mr. Harland, of Newbald, for the masonry. The structure will be 70 ft. in length built principally of stone, and consist of a school-room 50 ft. by 20 ft., a class-room, 20 ft. square, with offices and porch. The school is one of a group of five in the district, in connexion with the National Society, is under Government inspection, and is one of those towards the support of which Miss Burdett Coutts liberally subscribes. Although avowedly a church school, the conscientious scruples of the parents are regarded, the principle of a conscience clause being recognised.

Chester.—The corner-stone of new British Schools has been laid here by the Hon. Norman Grosvenor, M.P., for the Marquis of Westminster. The site selected is near the school premises at present occupied in Windmill-lane. The building which will be Gothic in style, and occupy three sides of a quadrangle, presenting the inner side as a front, will be a brick one, with ornamental dressings. It will consist of two stories, with a height of 14 ft. to each, and an entire height from the ground line to the ridge of 38 ft. On the ground floor there will be a girls' school-room, 59 ft. 2 in. long by 18 ft. wide, and a separate class-room projecting towards the front at the northern end, 13 ft. 7 in. by 12 ft. 2 in.; while the angle at the opposite end will be formed by the infants' school-room, 34 ft. 8 in. by 18 ft. There are separate entrances for girls and boys, by means of a lobby at this end of the building; and the boys will have to ascend a staircase to reach their schoolroom on the upper floor, which is 78 ft. by 18 ft., exclusive of the wing of 18 ft. by 16 ft. 6 in. extending over the infant-school and entrance to the girls' school; and there is also a class-room at the opposite end corresponding in size to the one below. Internally, the school will be lined up to a height of 5 ft. with glazed tiles, and the brickwork above whitewashed. The rooms will be well lighted, and ventilation obtained by sashes in the upper part of the windows, so as to avoid draughts. The architect is Mr. T. M. Lockwood, of Chester. The builder is Mr. Ray, of Nantwich. The buildings will accommodate about 500 children in the three schools, for boys, girls, and infants.

Wheelock (Cheshire).—New national schools, comprising separate boys', girls', and infants' schools, are about to be erected here, on land given for the purpose by Sir Charles Shakerly, bart., who is also a principal contributor to the erection of the schools. The plans have been approved by the Privy Council. Mr. Sugden, of Leek, is the architect.

Leicester.—St. George's new school-rooms are now erected, and opened. Messrs. Millican & Smith, architects, gave their services gratuitously in designing and carrying them out. The building is situate in Colton-street. The Decorated style is adopted, though the building is somewhat plain. The red Leicester bricks are used, with Bath-stone traceries to the windows, and copings to the gables, the principal of which are surmounted with ornamental ventilating turrets, also in Bath stone. The shafts to the doorways are in red Mansfield stone, from the quarries of Mr. Robert Lindley. In the embattled gable of the entrance, next Colton-street, there is a sculptured effigy of St. George and the Dragon, which, together with the masonry and the carvings, was executed by Mr. John Barratt, of the Humberstone-road. The contractors for the building were Messrs. J. Hutchinson & Son. The interior is very simple and plain; the wall is painted several yards high, and above is limewashed. There are three rooms—the infants', girls, and boys'—the first-named projecting from the other rooms. The boys' and girls' rooms are about the same size, but the other room is much smaller. The cost of the building is something over 2,000*l.*, of which there are about 300*l.* to raise.

Dorchester.—The new school buildings of the Dorset County School Company have been opened. The building is in the Venetian style. The principal façade, facing the south-east, consists of a centre pavilion of three stories, side wings, and end pavilions of two stories. The head-master's residence, the school department, and the domestic offices are designed to be entirely separated, and yet so arranged that they are convenient to each other, and that the head-master has control over the whole building. The head-master's residence occupies the east end. The principal or school entrance is in the centre pavilion, marked by a projecting hood, carried on stone corbels. The entrance hall is ornamentally treated with white and red bricks and stained woodwork. Right and left open out corridors. In the rear and central with its entrance door facing the principal entrance, is a dining-hall 70 ft. by 28 ft., lit with windows on each side, and at one end the room is also finished with white bricks, with a sufficient amount of red bricks to give an ornamental appearance. The corridor on the left of entrance communicates with the school department, consisting of three large class-rooms, a school-room, lavatory, box-room, &c.; and on the right of the entrance the master's private rooms are in front of the building, and the kitchen and various offices at the back. A door at the end of this corridor communicates with the head-master's residence. This residence has a distinct and separate entrance opening on to an entrance-hall, communicating with dining, drawing, and visitors' rooms. A stone staircase communicates with the bed-rooms on the first-floor. A wing running north from the east and at the back of the master's residence contains various offices. There is placed the tradesmen's entrance, matron's room and matron's store, larders, cellars, and laundry, with drying closet and fittings complete. A stone staircase on the right of the main entrance leads to the boys' dormitories on the first floor, ten in number, with masters' bed-rooms. In the central portion on the second floor is a large dormitory for junior boys, also with a master's bed-room overlooking it. There is also a room fitted up with baths, and a wardrobe room with separate divisions for the clothes of each boy, the whole heated by hot water. In communication with the matron's department, and isolated from the main portions of the building, is an infirmary. The building is supplied by water from the works at Dorchester. Generally the heating will be by open fires in the various rooms, but the dining-hall and drying-room in the laundry will be warmed on the Rev. H. Moule's patent principle. Closets and urinals for the boys are provided in the playground, and are fitted up on the same patentee's earth system. The façades are faced with white Poole bricks, relieved with red in bands and arches, with Bath stone dressings. The roofs are covered with slate. The grates were supplied by Mr. John Galpin, of Dorchester, who also fitted up the range and hot-water supply. The present building is calculated to accommodate 150 boys. The dining-hall will for the present be used as a chapel. The grounds consist of ten acres of land, a portion of which has been laid out for a kitchen garden, the remaining portion being set apart for cricket and recreation-ground for the boys. The designs were prepared and carried out under the personal superintendence of Mr. G. R. Crickmay, of Weymouth. Mr. Gregory was the builder, Mr. Gerard being clerk of the works and Mr. Chapman foreman. The original contract was accepted by Mr. Gregory at 4,243*l.* The site is on the Charminster-road, about a a mile from Dorchester, and above the village of Burton.

Colchester.—At Myland it is intended to have new schools erected from designs by Mr. E. C. Hakewill, of London, architect, at a cost of nearly 1,000*l.* Mr. Joseph Grimes, who will build the schools, has purchased the material of the old church and will use up a portion of the same in their erection. The site is on an eminence adjoining the present church, and near the village. It is the gift of the Countess Cowper. The buildings will include separate schools for grown children and infants, and residence for teacher, and will be constructed of stone rubble.

Much Dewchurch, Herefordshire.—New schools have been opened here by the Lord Bishop of the diocese. The schools have been erected by Mr. J. Rankin, the owner of Bryngwyn, at his sole expense, for the benefit of the children of the parish. The architecture is Gothic, and the work has been successfully accomplished, from the design of Mr. F. R. Kempson, of Hereford, by the contractors, Messrs. Coleman & Son. The woodwork is of pitch pine, with the exception of the flooring, which is of oak. The stone carving was the work of Mr. J. Welsh, jun., of Hereford. The opening of the schools was also made the occasion for the holding of the harvest thanksgiving services.

Bradford.—The corner stone of new Day and Sunday Schools, in connexion with St. Thomas's Church, Cropper-lane, has been laid by Mrs. F. S. Powell, of Horton Hall. The schools are to accommodate 700 scholars; and the estimated cost, including the value of the site, is 3,300*l.* Towards this amount about 2,700*l.* have been promised.

PROVINCIAL.

Market Drayton.—An addition to the few buildings in the town boasting of any pretensions to architecture has just been made in the erection of a New Bank and premises, in Cheshire-street, by the Manchester and Liverpool District Banking Company. The building is a detached block, situate on a plot of land bounded on the east side by Bell-lane and on the west by Cheshire-street. The building is of Gothic character, of red stone and yellowish brick, and is seen from all sides. The architects in designing the building have made each front equally good in detail. The building is two stories high, covered by a high-pitched slated roof, with ornamental finials. Under the eaves is an enriched cornice of bricks, and all the windows have stone quoin dressings. The banking-room is 33 ft. long by 24 ft. wide, and is fitted up with mahogany counters and desks, specially designed to accord with the style of architecture of the building; the space for the public before the counter is ample, and is provided with seats, desks, and a fire-place, and connected with the private room. On the floor level of the bank, and attached thereto, are a fire-proof strong-room, inclosing the safe, a clerk's room, and other conveniences. The manager's house contains entrance-hall, two entertaining-rooms, kitchen, scullery, and bed-rooms, and is fitted up with every modern convenience: there is a private door for the manager between the house and the bank. Between the building and Bell-lane there are a garden, terraces, and lawn; the porches, dwarf walls, gate-piers, and broken outline of the building, and the colours of the materials used, form a combination which harmonises with the old timbered buildings of the town. The boundary walls have been built straight, so as to improve the line of roadway, and a considerable quantity of land has been given to Bell-lane, so as to widen the road. Messrs. Swindells & Little, of Manchester, have been the contractors, and Mr. Harrison, clerk of the works; Mr. Fox, of Market Drayton, has done the plumbing, glazing, and gas-fitting; and Mr. Naylor, cabinet-maker, of Manchester, the bank fittings. The whole of the work has been executed by the several contractors, under the superintendence of Messrs. Barker & Ellis, of Manchester, the architects.

Society of Engineers.—Arrangements have been made for a visit of the members of the society, to the works of the Croydon Irrigation and Farming Company, on Tuesday, the 20th of September.

FROM SCOTLAND.

Edinburgh.—The Prince Consort Memorial, so far at least as the sculptor is concerned, is now approaching completion. The design was one of three submitted in public competition by Mr. John Steell, R.S.A. It consists of what may be generally described as a great pedestal, supporting a colossal equestrian statue of the Prince, and itself enriched with bas-reliefs and subsidiary groups of statuary. The structure, oblong in ground plan, is formed in three stages. The first of these, which presents faces of plain masonry about 4 ft. in height, has at each angle a square projection, designed to support a group of figures. Over this rises the second stage, which is to have its sides covered with quotation, from Prince Albert's published speeches. Ths third stage, or pedestal proper, is richly mouldede and exhibits on each side the bas-relief in bronze illustrative of the Prince's tastes, or of leading events in his life. Under the centre of each bas-relief a group of emblematic objects, suggestive of the Prince's honours and pursuits, will rest on the ledge formed by the projection of the second stage beyond the base of the third. The groups of statuary for which places are provided on the first stage are designed to represent people of all classes in the act of approaching the Prince with looks and gestures of reverence and affection. In accordance with Mr. Steell's expressed wish, the execution of these subsidiary groups was entrusted to other Edinburgh sculptors. That representing the aristocracy was undertaken by Mr. Brodie. The figures standing for the army and navy were assigned to Mr. Clark Stanton. The late Mr. M'Cullum took the group representing labour; but after accomplishing the greater part of his task, left it to be finished by Mr. Stevenson, who had also allotted to him the figures intended to denote science and literature. Of the four groups, only the one last mentioned now remains to be completed, and that, says our authority, the *Scotsman*, is nearly ready for casting. The other three stand complete in the bronze in Mr. Steell's foundry, where also may be seen the emblematic groups to be placed below the bas-reliefs. Of the bas-reliefs themselves, all designed by Mr. Steell, three are finished. With regard to the equestrian statue, which will of course form the leading feature of the monument, matters are so far advanced that, were the erection of the pedestal fairly commenced, Mr. Steell could easily finish his work within the time required to complete it. Meanwhile, some delay has taken place in respect to the pedestal, in consequence of the resolution adopted about a year ago to substitute Peterhead granite for freestone. Since this decision was come to, Mr. M'Donald, of the granite-working firm of M'Donald & Leslie, Aberdeen, has been systematically setting aside the largest and finest blocks; so that the monument may show the produce of the Peterhead quarries to best advantage. It will, however, require nearly twelve months to execute the commission for granite work, after the order shall have been given. The date at which the monument shall be finished depends on the time when the pedestal can be definitely ordered. That, again, depends on the raising of the 1,000*l.* or so which are still wanting to make up the extra cost of red granite. It was originally arranged that the monument should be erected in the Queen's Park, but of late a feeling has been gaining ground in favour of a site within the city; and it seems probable that the decision formerly arrived at will be reconsidered. A large proportion of those who take an interest in the question would seem to have a preference for Charlotte-square. One suggestion is, that the monument might be placed at the east side of the square gardens, opposite to the end of George-street, with the horse's head turned to the south.——Workmen have been engaged in placing in Greyfriars Church the sculptures by Mr. Hutchison, R.S.A., in memory of the late Rev. Dr. Lee. The monument in the church is twofold. A medallion, in high relief, of this divine, occupies a niche on the right-hand side of the wall, going towards the pulpit; and a figure, representing the Angel of the Resurrection, has been placed on the opposite side. The medallion and the figure are both of the finest marble. Besides these sculptures, the subscribers to the memorial commissioned Mr. William Brodie, R.S.A., to execute a bust of the rev. doctor, which is to be placed in the library hall of the University, in which Dr. Lee held the Chair of Biblical Criticism; and a suitable stone, with a copy of the medallionwill be placed over Dr. Lee's grave in the Grange Cemetery.

Dundee.—Mr. Gilbert Scott, of London, who lately inspected the Old Tower, Dundee, with a view to its restoration, has forwarded a report on the subject to the local committee. A special meeting was called for the purpose of hearing it read. Provost Yeaman occupied the chair. The report stated that the tower was not only one of the noblest in Great Britain, but that the originality of its design and the bold simplicity of its entire ideal, united with its wonderful effectiveness, gave it a very high rank among the works of our great Mediæval architects. He had not been able to meet with any distinct account of its erection, but he supposed it to date from the close of the fourteenth century, when Scottish architecture assumed a very distinctive and national form. He was of opinion that the original termination of the tower was after that of St. Giles's, Edinburgh, the resemblance of the upper stages of the two towers being most marked. The Dundee tower, however, was much the best in design, which led him to think that that at Edinburgh must have been of a little later date, and imitated from it. He was unable to discover when the original termination was removed, and the present uncouth house substituted. The house, he supposed, was erected as a watch-house, and from its age he was disposed to put it at the time when the fleets of Henry VIII. and Edward VI. made frequent descents upon the east coast of Scotland, and when a lofty point of observation would be important and useful to a large seaport town. The tower, as a whole, he said, was in a substantial condition, but externally it was much decayed. After referring to various details in regard to restoration, Mr. Scott concluded his report by recommending the employment of a thoroughly practical mason and an efficient clerk of works to undertake the necessary work. The cost of restoration would be at least 5,000*l.*, and possibly might exceed that sum. The meeting expressed the opinion that the report was a very valuable one, and resolved to ascertain from the various canvassing committees the amount of the subscriptions obtained. It was calculated that 3,300*l.* had been subscribed; and if, on investigation, this was found to be the case, it was understood that operations at the tower would be immediately begun.

Books Received.

Architectural Iron Constructions. By W. & T. PHILLIPS. 1870.

THIS little work, the first of a series, ought perhaps rather to be called a "Handybook upon the Use of Wrought Iron," as its object is not so much to propound any new theory, or introduce any new formula, as to methodise and apply in a practical and accessible manner the results and deductions of other larger and more elaborate works on the strength of materials and the theory of strains.

The work, when complete, will consist of five parts. 1. Beams and Girders, the pamphlet before us. 2. Fire-proof Floors. 3. Roofs. 4. Buildings. 5. Bridges.

The first part, now published, commences by comparing the various formulæ for timber, flitch beams, cast-iron beams, riveted beams, calling attention to Phillips's Patent, and finally dealing with beams of homogeneous rolled wrought iron. The formulæ are quoted *in extenso* in each case, and some examples are given showing the comparative cost, strength for strength, of the different materials. Lattice girders have also a special formula adapted for them and the various advantages attending their use in certain situations are clearly pointed out and illustrated by the plate.

A valuable part of the book will be found on page 17, which contains a table showing the safe distributed load in tons, &c., for clear spans or bearings, from 7 ft. to 40 ft. in the clear, of solid rolled girders, varying in depth from 4 in. to 12 in.

Given the weight to be carried and the bearing in the clear, a reference to this table will at once give the requisite section, large or small, of wrought iron required to do the work, and its weight per foot run.

To the educated and practised engineer the work is no more than a handy book of reference, but we cannot help thinking that, though really a trade book, it embodies in a concise and accessible form information that will be valuable to architects and builders, in regard to its subject matter.

Miscellanea.

Recreation for the Working Classes.—The prospectus of the People's Garden Company has just been issued. Its patrons are stated to be Lord Lyttelton, Sir Harcourt Johnstone, M.P., Mr. T. Hughes, M.P., Mr. E. Beales, M.A., Dr. Hodgson, Mr. W. B. Carpenter, M.D., F.R.S., and Mr. Henry Solly. The company has been formed, it is remarked, "with the object of securing for its shareholders and members land to be laid out as gardens and recreation grounds, in order to afford to the toiling multitudes, irrespective of class or country, healthy, rational, and elevating enjoyment, so necessary now that the extent of building has covered the former vacant spaces of the metropolis, and rendered the dwellings of the people generally so crowded and their surroundings so insalubrious." The prospectus goes on to state that the great object which the company has in view is, that its shareholders and members with their families may enjoy the exhilarating country air, fine music, and such recreation as will tend to the healthful development of body and mind. The company has secured a plot of 50 acres of land, beautifully situated, and being the larger portion of Old Oak Common, near Willesden Junction.

The National Education League.—At a recent meeting it was resolved that it is necessary that the organisation of the League should be maintained, both as regards the central office and the branches, for the following, amongst other purposes:—

1. To assist in putting the Education Act in operation, so as to secure, as far as possible, the establishment of unsectarian, compulsory, and free schools.
2. To promote amendments in the Act, by converting the permissive into obligatory clauses, and securing the recognition of the principle of religious equality in rate-aided schools.
3. To resist the increase of Parliamentary grants to sectarian schools.
4. To watch the progress of educational legislation in reference to the Irish system.
5. To influence public and Parliamentary opinion by meetings, publications, petitions, and all other available means in favour of a national, unsectarian, compulsory, and free system of education; and with this view to secure the return of members to the House of Commons pledged to support the principles advocated by the League.

The Alexandra Palace and Park.—An effort is being made by Mr. Francis Fuller, of Whitehall-gardens, and his friends, to organise a company to purchase the Alexandra Palace, with the view of opening it for the people of North London. It is proposed to form a company for this purpose on the Tontine principle, with a capital of 650,000*l.*, in fully paid-up shares of 20*s.* each, with power to issue debentures bearing interest at 5 per cent. per annum, to the amount of 150,000*l.* if necessary. The shareholders first registered, up to the amount of 500,000*l.*, will be those alone entitled to the ownership of the park, palace, and contents, which it is estimated will be worth, at the close of the Tontine in 1880, about one million and a half sterling. It is a pity that so fine a building as the Alexandra Palace, occupying a most picturesque suburban position, should be allowed to remain idle, when it might be profitably utilised for the purposes of public recreation.

Ancient Winchester.—The Winchester Gas Company have employed a number of men in laying down in the High-street, from the Market-place to the City Cross, an 8-in. main, in lieu of the old 4-in. one. In course of the excavations, which were necessarily carried down several inches deeper than before, the workmen came upon an ancient metalled road, from 3 ft. to 3 ft. 6 in. below the present road. The pitching of this ancient road was visible from time to time as they went along, whenever they had occasion to dig deep enough; and at the entrance or turning to Parchment-street, they came upon the crossing of the ancient road, formed of flat stones, similar to our modern crossings. The road thus brought to light is thought to have been the *via alta* of the Romans, and macadamised by them in the same way as the remnant of the Roman road from Winchester to Sarum, which may still be seen branching off from the Romsey-road to Flower Down.

Birmingham and Sir Rowland Hill.—At the Birmingham Exchange the ceremony has taken place of presenting to the members and to the public a marble statue of the late Sir Rowland Hill, who was a native of that town. The statue is of Carrara marble, 6 ft. 9 in. high, and placed on a pedestal 4 ft. in height. The sculptor is Mr. Peter Hollins, of Birmingham,

St. George's, Hanover-square. — The annual report of Dr. Aldis, the Medical Officer of Health, on the sanitary condition of the parish, has been issued in a printed form. It states that—

"The total mortality (1838) shows a decrease of 112 as compared with 1,948 recorded in 1868-9, representing an annual death-rate of 20 per thousand, instead of 21·3 in the previous year. But deducting the deaths (292), of non-parishioners at the preceding hospitals, the death-rate *at home* was 16·8 per thousand, which is the lowest that has hitherto been obtained for the whole parish during the last fourteen years. The annual death-rate throughout the metropolis, during the same period, was twenty-four."

Of the cleansing of the Serpentine, Dr. Aldis says, "a great outcry was made when the operations for emptying the lake first commenced, during a few unexpected warm days, but no increase of fever took place in my district, although situate in its immediate neighbourhood." Under the Workshops Regulation Act,—

"Forty-one establishments were visited against fifty-eight of the previous year, and it was necessary to caution eighteen of the owners against infringing the Act in future,—while thirteen were convicted,—one being the manager of a *model* establishment, superintended by a committee of ladies of rank, leaving ten against whom there were no grounds for complaint. Two more convictions would have occurred, had not the young women whose evidence I took been summarily dismissed, in one case, on the day the summons was taken out, so that, without knowing their addresses, they could not be called as witnesses: and, in the other, the three witnesses gave either false evidence to me, or committed perjury afterwards in the Police Court, Marlborough-street. . . . . I am sorry to record this instance of failure on account of untruth; but, at the same time, it is the only example that has come under my notice. I can, therefore, testify to the general truth of the women, who must be sometimes placed in very trying circumstances from intimidation and threats of being dismissed by some of their employers, unless they can be suborned to give false evidence."

Gas Purification.—The referees appointed by the Board of Trade have been experimenting on the purification of gas, especially from sulphur. They state in a report, that in regard to purifiers, as well as scrubbers, "the gas in some cases *was found to contain more sulphur when it left the 'purifying' material than when it entered it!*" The italics and note of admiration are taken from the report. The addition to the impurity in one set of experiments (lasting a month) was at the rate of 34 per cent., and in another set (lasting an equal time) as much as 37 per cent. In another set of experiments, carried on at another gas-factory, the results were simply nil, the gas coming out as it went in. After the gas enters the gasometers, there are further intricacies. The water on which the gasholder floats absorbs sulphur, ammonia, and sulphuretted hydrogen from the gas. A hot shining sun on the exterior may so warm the metal as to vaporise the filmy coat, and the impurity which is evaporated then "goes off with the gas." Thus the gas will leave the holder in a worse state than it entered it, a fact which is known to occur sometimes, though the cause does not seem to have been distinctly apprehended. These curious investigations, and others of a like nature, are still pending. The referees have invented a new description of sulphur-test.

Mechanical Appliances in American Agriculture.—The farmer in the great North-Western States is left very much to his own resources when executing many tasks which in older communities are managed by hired help. Thus we find the explanation of the fact that the first reaping-machine was perfected in the United States. The Americans have multiplied such discoveries, many of which, such as the cow-milking machine, exhibited in London in 1862, are hardly known here at all. The last thing of the kind is an "automatic grain-binder," which cuts, binds, and delivers its thousands of bundles of grain without wasting a kernel. A reaping-machine is no novelty, but one that cuts and then binds up the sheaves is something new. According to a Chicago paper, three acres of grain were cut clean and bound by it in two hours and a half. There is virtually no labouring class to denounce machinery as a foe to employment, and as a mischievous device of capitalists to grind labour into poverty and submission.

Men and Women of the Age.—Mr. S. C. Hall announces for early publication "A Book of Memories of Great Men and Women of the Age," with whom he has been, more or less, personally acquainted; comprising nearly all the Literary Celebrities of the present century. It will be extensively illustrated by portraits, birth-houses, homes in which they lived, and places in which they were buried.

Condition of Workmen Abroad.—A series of tables, compiled from reports of our Consular Agents abroad, has been issued, from which the following details are extracted. In France agriculture supports more than one-half of the total population of 38,067,064. Commerce and industry support more than one-third. Among the producing population are 10,884 employers in the building trades, and 480,388 workmen. Wages for carpenters are 4s. 9½d. per day; brickmakers, 2s. 9½d. to 4s. 9½d.; masons, 2s. 9½d. to 4s. 4½d.; painters, 4s. 9½d. The rate of wages has risen 25 per cent. since 1853, but the cost of food has risen 50 per cent. since 1855. In Belgium, out of a total population of 4,800,000, there are 1,000,000, men and masters, engaged in agriculture; 156,803 in commerce; and 866,947 in manufactures. Two-fifths of the population are engaged in manual labour. Wages for skilled labourers are stated at 3s. 6d. to 8s. per day; journeymen carpenters and smiths, 1s. 4d. to 1s. 8d.; carpenters on their own account, 4s. to 6s. per day. The workman's food is generally poor, and the houses deplorable. First-rate native work is hardly to be obtained; and every new undertaking is started by foreign money and enterprise. The Belgian workman is noted for producing a cheap article.

Lunatic Asylums in Ireland.—From the nineteenth report on the district, criminal, and private lunatic asylums in Ireland, recently published, it appears, that on the 31st of December in the past year there were in the country 6,316 lunatics in public, and 639 in private asylums, 5 in gaols, 2,907 in poorhouses, 45 in Lucan, supported by Government, and 170 in the Central Asylum; making a total of 10,082 registered lunatics, besides 6,579 living at large with relations or friends. A comparison is made with the numbers recorded in 1860, showing that there is an absolute falling off of 174 in the total number of insane persons in Ireland, and that 2,567 of those at large in 1860 have been absorbed into various asylums. The total number of persons discharged during the year was 1,625, of whom 1,011 are returned as recovered, 471 improved, and 143 unimproved. The total expenditure for the support and maintenance of district asylums for the year was 140,034*l.*, being an increase of 7,506*l.*, as compared with that of the previous year. The Central Asylum now contains 185 beds, an average of 70 men and 36 women being usually employed on industrial work.

Albury.—The building operations at Albury Park being finished, a more frequent residence of the Duke and Duchess of Northumberland there is anticipated. A new billiard-room has been erected, of lofty proportions, and panelled in polished walnut and oak, and with new plate-glass windows on the north and west sides. There is also a new steward's room, a large, but, from its being lighted from the top, a rather gloomy apartment. Various additions and alterations have been made in the *cuisine* departmen, and the stabling and coach-houses have been remodelled. Not the least interesting improvement is the fixing of electric bells over the entire house. About 12,000*l.* have been expended on the improvements. The whole of the work has been carried out under the superintendence of Mr. George Reavell, who, previous to leaving Albury to assume the office of surveyor to the Duke's extensive Northumberland estates, was presented by the principal tradesmen employed on the work with a testimonial, in the shape of a gold watch and chain, of the value of fifty guineas.

Tin Pipes.—The invention of Mr. H. Haines, Liverpool, relates chiefly to a peculiar mode of forming ingots of lead and tin combined. The said compound ingots are formed in moulds by the aid of mandrils or cores, with one metal concentrically within the other; the perfect union of the two metals composing the ingot being insured by the application of muriate of zinc or muriate of tin, or both, to the interior surface of the lead ingot, previously to casting the interior ingot of tin.

The Teign Valley Railway Seizure.—The workmen who seized the plant of the contractor for the Teign Valley railway, after it had been sold by auction under a bill of sale, as security for wages, amounting from 200*l.* to 300*l.* due to them, surrendered the property, after a week's possession, on the advice of their solicitor.

Sewage at Hertford: the Town Council. At the last quarterly meeting of the Hertford Town Council the important question of the disposal of the sewage of the town was brought under their consideration. A report was presented by the sub-committee, in which they recommend irrigation as the only satisfactory way of dealing with the sewage difficulty. A proposal from the Ware Local Board to take the Hertford sewage was considered, but they regarded the terms demanded (400*l.* a year for twenty-five years) excessive, and were of opinion that the corporation might carry out the works themselves at a smaller outlay; they therefore caused a scheme to be prepared by Mr. Grindle for disposing of the sewage by irrigation upon lands near Gallows Plain.

Statue of the Queen for Liverpool.—Shortly after the erection of the statue of the late Prince Consort, which stands in the open space in front of St. George's Hall, Liverpool, the corporation resolved to erect a companion statue of her Majesty, at a cost of 5,000*l.*, to be also erected in front of the hall, and the work was entrusted to Mr. Thornycroft, under the approval of her Majesty. The statue, which is an equestrian one, and corresponds in size to that of the late Prince Consort, has been executed at the bronze-foundry of Messrs. Elkington & Co., of Birmingham. The granite pedestal on which the figure will stand has been finished some time.

A Claim against the ex-Borough Surveyor of Batley. — Recently, Mr. James Wetherill, late Surveyor to the Batley Town Council, was summoned before the local magistrates, to show cause why he refused to pay 1*l.* 15s. 9d., the cost incurred by the General Works Committee in taking down and rebuilding a portion of a structure erected by him, but which was not in accordance with the plans he had deposited. Mr. Thos. Dean, town clerk, appeared in support of the complaint, which was duly made out, and defendant was ordered to pay the sum claimed and costs within seven days.

A Wheel.—There arrived at West Hartlepool, on Tuesday, a monster fly-wheel, intended for the rolling-mills of Messrs. Richardson & Sons. It measures 22½ ft. in diameter, and 17 in. by 13 in. thickness of rim, and weighs 25 tons 5 cwt. In order to transfer it to West Hartlepool—a thing impossible to attempt on the railway—a special carriage, weighing 7 tons, had to be built for its conveyance, and besides, some chains, of about 4 tons, were employed, making, with the wheel, a total of about 37 tons; and to move this no less than thirty-two horses were used.

The Old Tower, Dundee.—This interesting structure is about to be restored. Mr. Scott, who was called in, reported that he had not been able to meet with any distinct account of its erection, but he supposes it to date from the close of the fourteenth century, when Scottish architecture assumed a very distinctive and national form. The cost of restoration would be at least 5,000*l.* and possibly might exceed that sum. It is understood that 3,300*l.* have been already subscribed; and that operations will be soon begun.

The New Home and Colonial Offices.—It is believed that all the tenders delivered on the 15th inst. for the erection of the New Home and Colonial Offices, contained a stipulation that the general conditions of the contract were to be based on those agreed upon, for general adoption, on the 1st of August last, between the Council of the Royal Institute of British Architects and a Committee of London Builders.

Art Journals in Paris.—Should the war unhappily continue another month, there will scarcely be a literary or scientific journal published in Paris. In addition to a previous long list, we hear of the suspension of the *Moniteur des Architectes* and the *Chronique des Arts*.

The Defoe Monument in Bunhill Fields. The monument which has been erected in Bunhill-fields Cemetery, by the united subscriptions of 1,700 of the boys and girls of England, to the memory of Daniel Defoe, will be uncovered on this Friday, the 16th inst.

Buried Alive.—A tradesman of Penzance has been killed while assisting in excavating ground for the foundations of some houses in the town. A sudden fall of earth covered him, and he died almost as soon as he was dug out.

Unwholesome Filling-up of Excavations at Liverpool.—At a recent meeting of the Toxteth Local Board, Mr. Darsie called the attention of the Board to the practice of filling up excavations where building operations were to be carried on, with ashes from middens,—a probable cause of disease. He especially referred to a pit to the rear of Park-grove, about forty yards from the dwelling-houses, from which clay had been taken, and which was being filled up with these ashes. Hr. Hall, the surveyor, said it was one of those things that ought to be stopped at once. Ultimately, it was resolved that the clerk should address a letter to the mayor, asking the corporation to interfere with the further deposit of midden ashes at the place in question.

TENDERS.

For house in Kew-road, for Mr. C. Corben. Mr. George Truefitt, architect:—

Colls & Son	£1,084	0	0
Messum	1,793	0	0
Carter & Sons	1,740	0	0
Williams & Son (accepted)	1,623	0	0

For the removal of St. Peter's iron church from Chippenham-road, Harrow-road, to Fulham, for the Rev. R. C. Cardwell. Mr. W. S. Sargeant, architect:—

Kent (accepted)	£135	0	0

For the construction of about 3,000 ft. of new road, with drains, &c., at Margate, for the Rev. J. Back and Mr. C. T. Hatfield. Mr. F. Allen Edwards, architect:—

Hayward	£3,852	0	0
Whittick	2,895	0	0
Carlisle	2,683	5	10

For the erection of a new sea-wall, at Margate, for the Rev. J. Back and Mr. C. T. Hatfield. Mr. F. Allen Edwards, architect:—

Hayward	£2,623	0	0
Carlisle	1,391	15	11
Whittick	1,384	0	0

For the town sewerage works, construction of tanks, outfall works, &c., at Cleethorpes, Lincolnshire, for the Sewer authority. Mr. Alfred Edwin Skill, engineer:—

Acock & Henshaw	£3,339	9	9
Hudson	3,150	0	0
Hartley & Parkinson	2,999	9	9
Cawkwell & Co.	2,963	19	3
Kyan & Co.	2,943	0	0
Pearson & Co.	2,920	16	0
Metcalfe & Sons	2,800	0	0
Gregson	2,698	14	6
Conyard	2,675	0	0
Storrey & Jagger	2,583	13	0
Hayward	2,543	0	0
S. & W. Pattinson	2,454	8	7
Dickon	2,419	15	4
Waller	2,406	0	0
Fawkes & Sons	2,374	5	10
Walker	2,342	0	0
Young	2,240	4	9
Coker	2,240	2	0
Chapman	2,115	12	6
J. & A. Brown	2,059	0	0
C. Brown	2,045	16	10½
Bancroft (accepted)	1,975	0	0

For finishing villa residences, at Montem-road, Forest-hill. Mr. Robinson, architect:—

Neate	£2,814	0	0
Price	2,507	0	0
Capps & Ritso	2,456	0	0
Warr	2,289	0	0
Wevill	2,160	0	0
Hutchinson	2,050	0	0
Stanning	1,994	0	0
Hurst	1,872	0	0

For house and shop for Mr. Beall, Westcott. Mr. F. J. Dibble, architect:—

Inkpen	£359	0	0
Lynn & Dudley	348	0	0
Taylor & Clear	320	0	0
Putney	316	0	0
Hamblin	305	0	0

For the erection of a house, stables, &c., on the Bath-road, Slough, Bucks, for Mr. R. Little. Mr. E. Corfield, architect:—

Thompson	£3,600	0	0
Euston	3,121	0	0
Hollis	2,923	0	0
Sergeant	2,739	0	0
Heavell	2,595	0	0
Goodchild	2,050	0	0

For alterations and additions to 60, Grange-road, Bermondsey, for Miss Hunt. Mr. Nicholas Lake, architect:—

Roffey	£453	0	0
King & Sons	449	0	0
Greenwood & Son	440	0	0
Ashton	427	0	0
Preston	387	0	0

For laying 4,876 yards of pipe sewer, in the district of Stroud-end, Stroud, Gloucestershire. Mr. W. H. C. Fisher, C.E., surveyor:—

Clark	£2,600	0	0
Savage	1,998	14	4
Drew (accepted)	1,859	0	0

For building a cottage residence, for Mr. Burgess, Acton, Middlesex:—

Blick	£306	0	0
Walker	291	0	0
Thompson & Smith (accepted)	280	0	0

TO CORRESPONDENTS.

G. T.—T. C. N.—H. R.—T. J. H.—D. W.—A. H.—J. H.—A. E.—W. H. C.—J. D. H.—T. B.—W. M.—F. H.—J. W.—De S.—S.—A. T.—C. C. H.—T. H.—H. F.—H. S.—F. A. E.—W. L.—R. B. P.—F. D.—T. W. C.—G. R.—W. I.—R. G. T. (all the names should be given.

Are all the tenders recent?—Defrence (several cases as to "grinding money" have been reported in our pages).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

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SAML. P. BRABNER, Clerk to the said Board.

40, North John-street, Liverpool, September 9, 1870.

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The Builder.

VOL. XXVIII.—No. 1442.

The Revival of Ecclesiastical Architecture in Holland.

THE history of art during the last 300 years presents no feature of greater interest than the almost simultaneous "revival" of Gothic architecture in the three great northern countries of Europe. Whether the origination of this movement can be claimed by England or France is disputed. We claim it for England, where the earliest works of great merit erected in the revived style are to be found: still, it must be admitted, that in the study of the art and its history the French were early in the field; and although Germany can lay no claim to having originated the movement, neither England nor France can point to works of such magnitude as the completion of Cologne, Ratisbon, and Speyers Cathedrals. It is now our purpose to lay before our readers an account of the extraordinary revival of ecclesiastical architecture which has, within the last few years, taken place in the little kingdom of Holland. We say that this revival is extraordinary for three reasons: firstly, because Holland is the last country in Europe where we should have thought of looking for anything like enthusiasm about ecclesiastical art; secondly, because the neighbouring kingdom of Belgium, with which Holland was originally united, has done so little in the way of reviving Gothic architecture; and, thirdly, on account of the great number and size of the churches now being erected or recently completed by the Dutch.

Before commencing any description of the numerous works which we shall have to mention in this article, we shall make a few preliminary observations upon the causes which have furthered the revival of Gothic architecture in Holland.

It is asserted that one of the causes which led to the revolt of the Belgian provinces was the jealousy which existed between the Roman Catholics and the Protestants, and that, had the Government of the Netherlands acted with the same spirit of religious liberty and toleration which has since distinguished it, Holland and Belgium might still be under the same king; but the interference of the Government of the Netherlands with the internal affairs of the Roman Catholic Church, more especially in the affair of the Jansenist Archbishop of Utrecht, raised the suspicion and opposition of the whole Roman Catholic party in the country, which, combined with other influences, ultimately led to the separation of 1830, when the southern provinces of the Netherlands, who were entirely Roman Catholic, broke away from the northern or Protestant portion of the kingdom.

As at present constituted, the religious parties in Holland are divided as follow:—Protestants of the Geneva Confession, or Calvinists, number 1,942,387; Roman Catholics, 1,234,486;* Remonstrants, or Arminians, about 100,000; Lutherans, about 50,000. There are about 150,000 Jews; and 8,000 or 9,000 Jansenists. From these few general statistics of the various religions in Holland, our readers will be prepared to hear that the great movement in favour of ecclesiastical architecture is confined almost entirely to the Roman Catholics, as it is not to be expected that the Calvinists would give great countenance or support to such a movement, and the Lutherans and Jansenists are too few, and too scattered, to undertake such a movement; and thus the greater portion of the churches which we shall have to notice are in Limburg and North Brabant, which are (with the exception of the Grand Duchy of Luxemberg) the most completely Roman Catholic portions of the kingdom of Holland. It is necessary before proceeding further that our readers should understand the exact position held by the Roman Catholic Church in Holland. Although there is no *State* Church in Holland, there are two *Established* churches,—the Calvinist and the Roman Catholic. The clergy of both religions are paid by the State, and certain grants allowed for their schools and keeping their churches in repair. Only enough, however, is allowed for the absolute *necessities* of religion, *i.e.*, enough to keep the walls of the various buildings from falling, and their roofs weather-tight,—any ornamental works must be carried out by subscriptions made amongst the various congregations; and in the case of new churches, the Government *generally*, not always, gives a small sum of money to assist the work, if it can be proved to their satisfaction that there is an *absolute necessity* for it, and no difference is made whether it is a Protestant or a Roman Catholic place of worship which is required. In fact, to such an extent is this spirit of religious toleration and equality carried that when the present Pope, in the year 1850, re-established the Roman Catholic hierarchy in Holland, the Dutch Government not only abstained from opposing that measure, but increased the income of those amongst the clergy who were raised to the episcopate, and acknowledged them as the representatives of the Roman Catholic Church, so that all communications between that Church and the Government were carried on through the bishops. Within the last two years a separate "Minister of Worship" has also been appointed by the Government at the Hague. The Roman Catholic Church in Holland now is divided into five bishoprics and one "vicariate." The archbishop is at Utrecht; his arch-diocese comprises the provinces of Utrecht, Guelders, Drenthe, Friesland, and Groningen.

The diocese of Harlem comprises North and South Holland; the diocese of Breda, Zealand and the western portion of North Brabant; and that of Bois-le-Duc, the eastern portion of the same province. The diocese of Roermond is for the duchy of Limburg, and the vicariate of Luxemberg for the duchy of the same name. In the dioceses of Roermond, Bois-le-Duc, and Luxemberg, the ancient churches for the most part belong to the Roman Catholics. In the other portions of Holland they are almost entirely in the hands of the Calvinists. The Roman Catholics also possess the ancient cathedrals of Roermond, Bois-le-Duc (the most beautiful church in Holland, and of which we shall give views in a future number), and Maestricht (where the bishopric has not been restored).

Not only has the revival of Gothic or Ecclesiastical architecture been in the hands of one religious persuasion, but it has also been almost entirely the work of one architect, and he still a young man, Mr. Cuypers, of Amsterdam and Roermond. Before that gentleman began to build churches, which is not more than twenty years ago, the condition of ecclesiastical architecture in Holland was most deplorable. Gothic architecture was almost unknown for such purposes, and the mongrel Italian style in vogue could not be exceeded for ugliness or unsuitableness to the sacred purposes for which it was required. The examples of this style are very numerous, and some of them, we regret to state, have even been perpetrated within the last eight or ten years.

In order, however, to trace out how this wretched style, which we must call the "Greco-Dutch," came into existence, we must go back to the time of the Reformation in Holland, and trace its development step by step. As will be probably known to our readers, the Reformation in Holland took place half a century later than in England, and thus in Holland we find beautiful examples of early Renaissance work in the churches; such, for instance, as the stalls at Dortrecht, the pulpit at Bois-le-Duc, the side screens at Breda, and the greater portion of the stained glass at Gouda. Not that Gothic architecture ceased to be used, for we find at Gouda, Breda, Delft, and Amsterdam, Gothic work which dates from quite the end of the sixteenth century. The churches built after the Reformation (that is, within the first century after the change of religion) are of a most singular style, a kind of round-arched Gothic, with very clumsy Italian detail. A good example of this style is the (so-called) "Nieuwe Kirke," or new church, at the Hague, an ugly but not unpicturesque building. Very few churches of this date exist in Holland. This singular style was succeeded by regular Italian architecture; but with the tall bulb-shaped spires and turrets, to which the Dutch were so attached, and high-pitched roofs grafted on to it. The Catholic and Protestant churches at Rosendael, the Lutheran church at Maestricht, and several churches at Rotterdam and Amsterdam, are good examples of this style. This kind of architecture lasted down to about the year 1780 or 1790. Spires of this date (between the years 1600 and 1790) are to be found all over Holland. Perhaps the most graceful are those of the cathedrals of Bois-le-Duc and Breda, of the churches at Gouda, Boxtel, and Helvetsluis, and of the town-halls of Alkmaar and Groningen. All these spires consist of a series of lanterns and bulbs, placed one over the other, crowned at top by a slender pyramidal spire, finishing in a vane or cross.

After the year 1780 or 1790 we find the dome frequently used, and the style becomes more classical. Good examples of churches in this style are the two older Roman Catholic churches at Rotterdam, and the churches of St. James and St. Mary, at Bois-le-duc. The two latter churches are remarkably clever, and we have rarely seen the internal supports of a dome better arranged. We were, unfortunately, unable to learn either the exact date or the name of the architect who built these two remarkable churches. Out of this pure Italian style by degrees grew the terrible architecture to which we have given the name of the Greco-Dutch. It consists in mixing up the heaviest features of Greek architecture with the fanciful style of ornament which one is accustomed to see upon Dutch clocks. A wonderful example of this detestable style is the Roman Catholic church at Bergen-op-Zoom, the front of which is a regular Dutch clock-case, enlarged. Scarcely less hideous are the churches of St. Peter and the Protestant church at Bois-le-Duc, the Catholic churches at Delft, Breda, and Dortrecht, and we grieve to say this style is not quite abolished even now.

Few examples of "Brummagem" Gothic are to be found in Holland; in fact, we know of only two or three churches to which this term may be fairly applied. They are the Roman Catholic church at Schedam (the interior of

* These figures are taken from the census of 1865.

which is undergoing great alterations, from the designs of Mr. Cuypers, and will in a short time be really far above reproach); the "New" (Protestant) church at Rotterdam, an abominable octagonal building; and the new church now building by the Jesuits at Maestricht.

The earliest real Gothic church built in Holland was the Redemptorist Church at Amsterdam, from the designs of Mr. Molkenboer, erected between the years 1845 and 1850. It is a poor building, vaulted in plaster, and possessing neither tower nor spire, and not particularly ecclesiastical in arrangement. About fifteen years back Mr. Cuypers commenced his fine church at Wijck (a suburb of Maestricht). This church may be looked upon as the first really satisfactory building of the kind erected in Holland during the "Revival." It is a cruciform building, consisting of a nave and aisles, transepts, a spacious single choir (over 60 ft. long), and a tall western tower, crowned by a slate spire. The whole church is built of brick, with stone dressings sparingly used, and internally the church is vaulted throughout in brick, with stone ribs. Its dimensions are as follow:—Entire length, including western tower, 163 ft.; width across transepts, 91 ft.; width of nave and aisles, 61 ft.; height to the vaulting of nave and choir, 62 ft.; height to top of spire, 221 ft. The style chosen is that of the end of the thirteenth century, very simple and plain,—in fact, the exterior, notwithstanding the flying buttresses of the nave, has rather a bare and bald appearance. The tower and spire are excellently designed; but the small *flèche* at the intersection of the transepts and nave is too small, and the pitch of the roof is not high enough. Internally the general effect of the church is very good, and is much helped by the decoration, which is harmonious in colour and well designed. The walls are rather too thin, and the columns want boldness. There is no triforium, and the blank space below the clearstory windows gives an appearance of flatness to the nave of the church. The furniture of this church is all good. The choir is arranged in a Ritualistic manner, with excellently carved stalls on either side, and a lectern in the middle. The altars have oak reredoses, well carved and judiciously decorated. All the windows of the nave and transepts are filled with mosaic glass arranged in geometrical patterns, which has a good effect. We cannot, however, say the same for the stained glass in the choir, which is far from satisfactory.

Although Maestricht has the honour of having built the first really satisfactory Gothic church of modern days in Holland, the ecclesiastical works carried out in that city since the erection of the church at Wijck are anything but what we could wish them to be. The new Franciscan church was commenced about eight years ago, and has been very completely carried out. It consists of a nave and aisles of five bays, and a choir the same length. The style chosen is that of the latter part of the fourteenth century. The nave is separated from the choir by a solid stone rood-screen, the centre of which is pierced by a doorway, on each side of which is an altar. The choir has two rows of stalls on each side, a lofty stone "sacrements hauslein," and a very elaborate stone altar. The defects of this church are firstly its sham construction, the vaulting and all the arches being turned in plaster; secondly, the wiryness of its detail; and thirdly, the wretched decoration which disfigures, rather than assists, the architecture. The church was erected from the designs of Mr. Weber, of Roermond.

A third church is now being erected at Maestricht, for the Jesuit order. It consists of a nave and aisles, with an apse at the east end, and three turrets at the west end. Internally, everything is done in plaster, and the whole thing is as bad as possible. The design is by a lay brother of the order, and it is a caution to amateurs not to build without professional assistance.

The Cathedral Church of St. Servais is being excellently restored by Mr. Cuypers; but of this restoration we shall have occasion to speak on a future occasion.

A good church, very similar in plan and general arrangement to that of Wijck has been erected at Maesbracht. The architect is Mr. Cuypers.

At Roermond the Cathedral Church of St. Christopher, a large late fifteenth-century building, is being restored by Mr. Cuypers. The portion of the work at present in course of execution consists of filling all the windows with mullions and tracery, every vestige of which was destroyed during the last century, at which time also the church was whitewashed, and robbed of as much of its interest as possible.

Another and still more important work of restoration being carried out by the same architect, is the completion and renovation of the beautiful Romanesque Minster Church at Roermond. This building, the most beautiful example of twelfth and thirteenth century architecture in Holland, is, after a lapse of six centuries and a half, being completed by the addition of the four lofty towers contemplated by the original architect. The whole of the interior as well as the exterior is to undergo a careful and complete restoration. The portion of the work already carried out does great credit to the architect; and when we state that all the plans for this work have been signed and approved of by M. Viollet-le-Duc, who was the consulting architect to the work, we need scarcely say that this restoration is highly satisfactory.

As we shall give a view of part of this church, and also a description of it, we shall have occasion again to refer to this restoration. The episcopal seminary at Roermond was erected some years since from the designs of Mr. Weber. It does not add greatly to that gentleman's reputation as an architect.

The restoration of the Roman Catholic Cathedral at Utrecht (formerly the Franciscan Church) has been previously mentioned in our pages. On the whole the work is a satisfactory one. The architect is Mr. Van-der-Brink, but all the woodwork, stalls, pulpit, altars, &c., were designed and executed by Mr. Engleberger; and the superb decoration, which is by far the cleverest portion of the whole work, was designed and executed under the direction of Mr. Kleinertz, of Aix-le-Chapelle, the talented artist who is now decorating Ste. Maria zu Capitol, at Cologne, and the Cathedral at Aix-le-Chapelle. The great similarity of this decoration to some that we have seen by Mr. Cuypers led us, in our former notice of this church, to attribute the work to that gentleman. The new Catholic Church at Arnheim is also from the designs of Mr. Van-der-Brink. Although the general effect of the interior of the church is pleasing, the detail shows great ignorance of the true principles of Gothic architecture, and the tower and spire are quite Brummagem.

The magnificent Cathedral Church of St. John at Bois-le-Duc, or s'Hertogen Bosch, as it is called, in Holland, is undergoing a partial restoration, from the designs of Messrs. Hessemans & Veneman. Although we wish to do all justice to the work of these gentlemen, as we were treated with great courtesy by one of them, we cannot bestow unmitigated praise upon this restoration, and for two reasons—in the first place, we cannot approve of the destruction of the fine Renaissance rood-screen which adorned this church, nor are we satisfied with the restoration of the sculpture in the great north front. However, we shall refer to this on another occasion, when we shall give views and a description of the cathedral.

A new church for the Redemptorist order was erected some six years ago in the same town. The architect was Mr. Van Vaecker. The church consists of a nave and aisles the same height, a short chancel, two side chapels, short transepts, and a lofty flèche at the intersection. The style chosen was a mixture of Second and Third Pointed Gothic. We cannot say much in favour of this building. The exterior is too spikey, and the interior is entirely executed in plaster. The whole church is decorated in colour, the effect of which is far from good, and has a dingy appearance, probably caused by the use of stone colour instead of white.

The above-mentioned Church of St. James has been charmingly decorated by Mr. Cuypers. The dome has a kind of conventional colonnade, painted round the lower portion of the drum with figures rather severely treated. There is a great deal of dead white in this decoration, which has a charming effect. There is some stained glass, too, which is not bad in its way. We must continue the subject in another article.

Ragged School, Manchester.—We learn that Lombard-street Ragged School and Working Men's Church is so fully attended that a new building is projected, to accommodate from 600 to 700 scholars. We are glad to hear it; but we recommend a revision of the façade designed. As shown by a lithograph published, it is terribly ugly.

ARCHÆOLOGISTS IN HEREFORD.*

THE Palace at Hereford, where the Bishop and Mrs. Atlay received the British Archæological Association on the 7th inst., as we briefly mentioned in our last, is a very remarkable building, the greater part being contained within a Norman Hall, of necessarily great size. This size will be tolerably obvious when we say that it now includes a drawing-room, dining-room, entrance-hall (all lofty and grandiose apartments, Modern Italian in style), and the Bishop's own private rooms. It must not be supposed that the Norman building to which this immense hall belonged had many other apartments of corresponding size and dignity. The fact is, as many of our readers know, that a Norman mansion consisted of little more than a hall and a large bedroom or two. In the hall they ate and drank, men and master, the former sleeping there also. *Aula* in old Latin, and modern too, for the matter of that, means a palace and a court. The Saxons called such a building a *heall*, the French a *salle*. Thus, therefore, while in old times one apartment, to speak broadly, was called an *aula*,—a noble residence,—we now call many a noble residence, with many apartments, a Hall. The roofs of these Norman halls were often supported by ranges of wooden pillars. It was the case at Hereford, where there were two ranges, forming it into three aisles, and the ancient roof and Norman capitals of wood may still be studied.

At the meeting in the Palace, the Rev. W. L. Beavan described the

Mappa Mundi,

preserved in Hereford Cathedral, and concerning the approaching publication of which we spoke not long ago. This map has been an object of interest to geographers and antiquaries since the year 1780, when a description of it appeared in Gough's "British Topography." Nothing was known by those who first studied the map either of its connexion with the Cathedral of Hereford or of its date, except what was gathered from internal evidence. Mr. Lelewel, from the style of its penmanship, conceived that it was executed about 1220. M. d'Avezac, ingeniously comparing the course of historical events in the fourteenth century with the political divisions as indicated in the map in respect to France, Burgundy, and Flanders, concludes its date to have been between 1313 and 1320. English antiquaries (we are following Mr. Beavan) have pronounced the style of writing to belong to the twenty years from 1290 to 1310. But recent researches into cathedral records have fortunately furnished us with sure ground as to its proximate date, and as to its connexion with the cathedral. Richard of Haldingham, having previously held office in Lincoln Cathedral, was endowed with the prebendal stall of Norton in Hereford, and retained his prebend from 1290 to 1310. He was subsequently connected with the chapter of Salisbury, and became Archdeacon of Berks. It can hardly be doubted that the map was executed while he was prebendary of Hereford, and the period which is thus defined satisfactorily coincides with the conclusion of the English antiquaries from the style of the work. The map is drawn in accordance with the notion which, with modifications from time to time, was the prevailing one in Christendom for more than seven centuries, from the time of Orosius and St. Augustine, until travellers in distant regions became more numerous, observant, and communicative. The habitable earth is represented as a circular island, with the "ocean stream" flowing round it. Jerusalem is placed in the centre. Asia occupies nearly the whole upper (or Eastern) half of the circle, while Europe holds the lower quarter on the left hand, and Africa that on the right. This arrangement is common to most of the Mediæval maps of the world. But the Hereford map is distinguished from the rest by its great size, its elaborate drawing, its illustrations of objects in natural history and of historical facts, and its numerous inscriptions, many of which are of great interest in an archæological point of view: and it may be regarded as the most complete representation in existence of those speculative notions of our forefathers regarding the earth, which speedily gave way upon the advance of actual geographical knowledge in the fifteenth century. The interest of the map is greatly increased by the decidedly religious character of its chief illustrations. In a sort of

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* See pp. 720, 737, *ante*.

gable over the circular border is a striking and curious representation of the Last Judgment; and in the map itself the eating of the Forbidden Fruit in the Garden of Eden, the Crucifixion on Mount Calvary, and other events in Biblical and ecclesiastical history, are prominently shown. Many of the legends partake of the same character. This fact, together with the peculiar form of the drawings, has furnished ground for a conjecture that it was intended for an altar-piece of one of the chapels of the cathedral. The map, which has formed at various times the subject of numerous essays, is elaborately drawn in colours on vellum, and shows that its author must have been a distinguished caligrapher. But the ravages of time are too perceptible in the work, and some parts can only be deciphered with difficulty. It is obviously desirable that a very correct copy of it should be made while it is still possible to reproduce the colours of the original, as well as the drawing and the writing. A document so important in its bearing, not only on the history of scientific knowledge, but on the legends of the Middle Ages, should not be suffered to perish, and ought to be placed within easy reach of students at home and abroad; and it is therefore proposed to publish a *fac-simile*, executed with the utmost care in coloured lithography, to be accompanied by a photograph of 15 in. in diameter, by which the critical accuracy of the copy may be perfectly tested with the aid of a glass. Letterpress will be added, which will contain all that is known of the author, copies of the whole of the legends in the map with explanations, and a critical examination of the map and of its place in the history of cartography. It is expected that this work will be published about the latter part of the year (1870), and specimens of it, admirably executed under the direction of Mr. G. C. Haddon, architect, of this city, were with the original exhibited.

Mr. Havergal, responding to a request made to him that he would say a few words, wished every one to know that those who had undertaken this work had done so not in the hope of deriving any pecuniary advantage therefrom to themselves, but solely in the hope that they might add something worthy to English literature, and in the wish to do that justice which had never yet been done to the famous Hereford map. Taking occasion, in speaking upon this subject, to refer to the ancient chair of the bishop preserved in the cathedral, Mr. Havergal directed attention to the close similarity between the chair in question and that in which in the *Mappa Mundi* the Pope was seated. The resemblance of the two was so close that he could scarcely see how any one could avoid coming to the conclusion that to have drawn that chair on the map the author must have seen some such one somewhere, and he suggested that that particular one was no other than the old chair at present in the cathedral.

On the same evening a paper on

The Ecclesiastical Statesmen of Hereford,

by Mr. Henry F. Holt, was read, treating especially of Bishop Aquablanca and St. Thomas de Cantilupe, of whose monuments we spoke in our last. Aquablanca was a great favourite of King Henry III., and the king, to mark his personal esteem for him, presented him with two mitres, as appears from the following warranty still existing. The first, dated 1239-40, runs thus:—"Pay to Master Joseph, the goldsmith, 14 marks for a certain mitre, purchased and given by our command to Peter de Aquablanca, Bishop of Hereford." The second is dated February 11th, in the twenty-fifth year of the reign of Henry III., and runs thus:—"Pay from our treasury to Edward, the son of Odo, 82*l.*, for a certain mitre, made by our command for the use of the venerable Father Peter, Bishop of Hereford, of our gift." These mitres remained the insignia of Hereford's bishops, and were used by the majority of his successors until the Reformation. Mr. Holt's account of Cantilupe (a descendant of the Norseman family of Champ de Loup—Campus Lupi—and son of William de Cantilupe, governor of the Castle of Hereford, 1202), was very interesting, and included some fresh information, but we are forced to pass it over.

We must add to the account we gave of the visit to the curious group of Norman churches in the morning, before going to the bishop's, Mr. Blashill's account of

Rowlstone Church.

The main portions of the church, he said, appear to belong to the period between 1130 and 1150. Its twelfth-century work, although possessing some peculiarities which I shall have to point out, is generally consistent with the Norman type, and free from ornament of the Celtic class. Yet there is a piece of foliage on the south doorway similar to some that I pointed out at Kilpeck, and exactly like that which is used in a similar position at Shobden. The sculpture in the tympanum of this door, which represents our Lord in an aureole, supported by four angels, is also like that at Shobden, except as to the position of two of the four angels. This carving has been said to have reference to the text "I am the door." But it is really and solely that most favourite subject with all early Mediæval artists which is known in England, France, and Italy alike as a "Majesty." We find it as early as the fourth century (?) in the catacombs of Rome, where Christ is represented blessing, with his right hand open, and having a roll in his left. It was used profusely and with many varieties in sculpture, painting, stained glass, and manuscripts, and, of course, over doorways also. Sometimes in large churches an attempt was made to represent in some measure the striking scene described in the fourth and fifth chapters of the Revelations. There is the Lord sitting on the throne, surrounded by the rainbow like unto an emerald. At the four angles of the subject are the four beasts, which, in process of time, were considered to be symbolical of the four Evangelists, and on the arch above and the lintel below encircling all are the four-and-twenty elders. Here we have simply the Lord in an aureole, supported by four angels. The sculptor, for the sake of increasing the size of the tympanum, has brought it down below the upper line of the capitals, and has also adopted the heavy roll moulding of the arch of the same thickness of the column below. These were local peculiarities, of which other instances may be given as that of Bredwardine; and they were also adopted in Ireland and in Wales in the twelfth century. Two remarkable pieces of sculpture exist at the sides of the chancel arch. In each of these is the figure of a saint with an attendant angel, in the traditional flowing costume used in early sculpture, and with bare head and feet, and the flat nimbus behind the head. Those on the north side carry each a cross and book. The practice of placing the attributes of the Apostles in their hand, as the keys in St. Peter's, was then only of recent introduction at the time these figures were cut, and it would not be easy to identify them if those on the south were not placed with their heads downwards—a plan indicating that the figure on this side, if not the other also, is intended for St. Peter, to whom the church is dedicated. This was a very favourite subject with the Mediæval artists. Peter having been by tradition supposed to be crucified in that position by his own desire. Samuel Dowsing, who was authorised to go through Suffolk in 1643, breaking all the pictures and figures which he could find, makes this entry in his journal in reference to the Church of Allington:—"In the chancel was Peter's picture, and crucified with his head downward, and there was John Baptist and ten more superstitious pictures." The best known instance of this subject is the remarkable altar-piece painted by Rubens for the Church of St. Peter, at Cologne. In the figure at Rowlstone the saint carries in one hand a long label, in allusion to the tradition which attributed to each of the Apostles one sentence of the creed. The cocks, which are finely sculptured on the adjacent capitals, doubtless refer to Peter's denial of our Lord. The birds carved on the string-courses are of the same kind as those already seen at Kilpeck. They are set amongst tufts of herbage, and are excellent specimens of twelfth-century carving. The two iron brackets fixed to the walls of the chancel seem to be of the fourteenth or fifteenth century, and they are hinged so as to fold against the wall, and have each five prickets for holding the ends of long candles, which would go through the rings above. Alternate ornaments of cocks and fleurs-de-lis, cut out of thin iron, are fixed on both sides. The two brackets differ both in size and in design, and were probably not the work of the same hand. They are the only examples of this kind in England. The chancel is ceiled with an oak ribbed and panelled ceiling of the ordinary type, though there are not many specimens in Herefordshire churches. The old porch of this church had a similar one, very much decayed. To the archæologist this district possesses unique attractions. In the church of Kilpeck we have the very last struggle of the decaying style of Celtic ornament. In Rowlstone we see the Norman work of the twelfth century with its Roman, perhaps Byzantine influences. In the neighbouring church of Garway, built by order of the Knights Templars, the sub-arch of the chancel opening is of a pattern which, if not Saracenic, is at least quite foreign to the native Norman style. Besides these, few village churches are without substantial remains of the later or transition Norman, and in the remains of Abbey Dore we see how the native English architects—although greatly under the influence of a foreign order of architecture—knew how to throw aside the influences which then prevailed in France, and to work out for themselves a beautiful style of architecture which, as the Early English, in its own way rivals the choicest specimens of Continental art.

An Unfinished Effigy.

The church at Grosmont presents the peculiarity of a gigantic unfinished effigy, lying between two of the arches in the nave. It is merely roughed out, the head and arms being the most finished. It is said to commemorate one of the earls of Lancaster, who died in the thirteenth century, and has necessarily a curious and unusual aspect.

At the evening meeting, on Thursday, after the visit to Leominster and other Churches, the Rev. Canon Jebb read an elaborate paper, treating of

The Origin of Written Alphabets,

a subject on which we are completely in the dark. He considered the art of alphabet writing was too subtle, too perfect in itself, to have ever originated in man. He thought it impossible for human intellect to have devised it, and he attributed it to Divine origin. He had a strong impression on his mind that it was not very probable that alphabetical writing could have been deduced from idiographic writing, for entirely different powers of mind and thought were requisite for the one to what was required for the other. All idiographic writing was imperfect; it expressed images, and not words. Any one who was acquainted with the Chinese characters knew how imperfect they were. They must supply many of the words by their own thoughts, and different expressions might be given by different persons to the same characters. Whether it was the same as regarded the Egyptian characters could not be said. As yet the Egyptian characters were but imperfectly understood; but the different versions that had been given of them showed that they were very imperfect means of communicating thoughts. As to the heliographic characters found on the outside of buildings in Central America, he thought they were analogous in their forms with the Chinese. He had little doubt that in the course of time the keys to these ancient monuments would be discovered. It had been suggested, and with some show of reason, that it was probable the art of alphabet writing was communicated to the Israelites by Moses, and that in all probability the Tables of the Law were the first instance of this art. He merely stated this as something worthy of consideration. He thought all our letters might be traced to the most ancient alphabet in the world. He enumerated many nations the characters used by which he traced with modifications to the Phœnicians. Dr. Jebb then alluded to the extraordinary monument discovered near Sidon, a few years ago, by the Duc de Greve. On it was, in characters well defined, a Phœnician inscription, about thirty lines long, stating who the individual was that was interred, and the subject of the inscription was a severe reprobation of any one who should attempt to open the tomb, and the utterance of maledictions and the vengeance of the gods on the spoliators,—that "Their fruits might wither from the bough and their roots decay from the stem,"—altogether a poetical inscription. He believed this was the longest Phœnician inscription yet discovered; and, with one or two slight exceptions, the characters were the same as those lately discovered on the Moabite stone. This appeared to him to be one of the most clear connexions of the Greek with the Phœnician.

Mr. W. H. Black's review of the

Archives of Hereford

had been looked forward to with much interest, and did not disappoint. The remarkable skill and fluency with which that gentleman, glancing

through an old Latin document, picks out its object, and conveys it in English to his audience, is now well known. The first to which he referred was one issued by John, minister of the church at Hereford, in which it was stated with respect to all the parishioners who should come to hear mass in the chapel of the Virgin Mary in this church of Hereford in honour of the Virgin, and should say prayers for the Church and State of England, and for the souls of John, Lord Breton and his wife, or should offer their goods, or give anything charitable for the maintenance of the same chapel, the indulgences granted by any other Catholic bishops were confirmed. It was dated 1271.

This, it will be seen, proved the use of the Lady Chapel before 1271.

Mr. Black said the next document to which he would call their attention was a bull of Innocent IV. It stated in this bull that whereas some of the canons had received their entire revenues they were unwilling to contribute, as others, towards the support of the fabric and the expenses of the cathedral, the Pope authorised the enforcing of a regulation made by the bishop and by a major part of the dean and chapter for compelling the payment by deduction of the rateable proportion of contribution to be paid toward the fabric and the expenses of the cathedral. This was a very important document. No doubt to it must be ascribed the erection and beautification of many parts of the cathedral. Another little document, with one seal broken, was an acknowledgment of money value of a legacy received (a palfrey and a ring), left to "John," Archbishop of Canterbury, by Thomas St. Cantilupe, Bishop of Hereford. The archbishop's seal was attached to the document, and it was very sharp and fine. The next document he would refer to was one of the most interesting. It related to a love affair of Edward I. It appeared that the king had sworn that he would have a certain lady. She married somebody else and the king married somebody else, and the difficulty could not be got over without a suit being regularly instituted in Rome. There was, as usual a commission of delegates to determine the matter; and this instrument set forth the proceedings and the sentence, which, of course, absolved them from all further ecclesiastical difficulty about it. Mr. Black, who was loudly applauded, then proceeded to describe some of the city documents which he had inspected. He had, he said, in his hand, the first charter of the city, but they must not suppose that it created the corporation, because it was an old Roman corporation. It was given by Richard I., and it gave permission to the citizens of Hereford in Wales, for the sum of forty marks of silver, if they aided in enclosing the town, to hold the town with all their liberties, forms, and customs. He could not touch upon all the charters, of which he thought there were thirty-one; but there was one document in which Edward III. gave pardon to the men of Hereford, and withheld all wrath and rancour which he (the king) had against them for certain transgressions and trespasses till the feast of All Saints. This was dated the 23rd of October. Other city charters and documents were referred to by Mr. Black, and particularly one which threw some light upon the position the chief bailiff of the city held in relation to other towns. It appeared that Hereford was considered the principal city of all the market towns from the sea to the Severn. Mr. Black then read a document relating to certain regulations to be observed and duties to be performed while the city was in a state of siege. For instance, if any citizen received letters or messengers from the enemy without informing the authorities, he should be led at once to the market-place, the common bell should be tolled three times to call the people together, and the offender should be required to abjure his city with his wife and children, and never to return to it unless he obtained a special licence to do so.

One of the papers read on Friday evening was by Mr. Severn Walker, and had for its subject

Detached Church Belfries,

with special reference to those found in the county of Hereford. Having enumerated various existing and demolished belfries detached from churches, he observed that they varied in character from the poor little structures in Herefordshire to the magnificence of Magdalen, Evesham, and Whalton. No certain rule could be given for their position—placed east, west, north, or south, often not parallel with the church, and at almost every degree of distance from the church. The detached belfries of parochial churches very rarely occurred except in West Norfolk and in Herefordshire, in which districts it appeared to be a localism. The former county contained five examples — at West Walton, East Dereham, Wisbeach, and Ferrington. At Beccles, in Suffolk, was a grand Perpendicular tower south of the chancel. At Berkeley, Gloucestershire, and Brynllys, Brecknockshire, the towers were modern, but they occupied the sites of Mediæval structures. Herefordshire, however, boasted the greatest number of detached belfries, and to these he then directed attention. They were seven in number, and might be divided into two classes: those which differed from the ordinary church towers only in being more or less separated from the main building—Ledbury, Bosbury, Garbury, Holmer, and Richard's Castle; and those which had a character peculiar to themselves, viz, Pembridge and Yarpole. Mr. Walker then proceeded to describe these towers in detail. Ledbury was by far the finest church tower, architecturally considered. It stood on the north side of the church, about 4 ft. from the north-west buttress of St. Catherine's Chapel, and about 35 ft. from the aisle wall. It is in the Early English style, divided into four stages, with massive buttresses at the angles. Here, within a battlemented parapet, rises a lofty stone spire, rebuilt by Robert Wilkinson, who erected the tapering spire of St. Andrew's at Worcester, about the middle of the last century. Selwood speaks of a charnel-house being attached to the tower. Bosbury tower stands at the south side, at a distance of upwards of 60 ft. from the aisle. It is 29 ft. square, divided into three stages by set off. Having described the other Herefordshire detached belfries, Mr. Walker concluded his paper by some brief observations as to the reasons for detaching these belfry towers from the churches. He thought, probably, they owed their unusual position to the caprice of their designers alone.

A Saxon Consecration Deed.

Amongst the places visited on Saturday was the church at Peterstow, which during the last few years has been restored. The visitors were received at the church by the Rev. Canon Jebb, who gave an interesting description of his church. One fact of considerable interest is that the canon has the original record of the consecration of the church in the time of King Harold. The church was founded in the year of the Conquest, or a little before, and Canon Jebb thought that they had some of the remains of the work of that time. In the north wall of the nave there was a round Saxon or Norman window, very deeply spread. He did not think he was presumptuous in putting the date of this window at the foundation of the church. He was very obstinate, he said, and his belief was there was still some work of the Saxons to be found there. It was remarkable how many churches were said to have been destroyed by the Normans, but he inclined to the belief that in many cases they made use of the materials they found ready at hand. The window was the only evidence of Saxon remains, except some masonry in the outside of the church.

At the concluding meeting the *pièce de résistance* was a valuable paper by Mr. Edward Levien, M.A., on

The Hereford Missal,

premising that a *Missal* was the book which contained the rites, ceremonies, and prayers to be used in the celebration of the Holy Communion. It is a very common mistake to call all illuminated MSS. "missals." At the British Museum it is a circumstance which occurs almost daily that persons come and ask permission to see the "illuminated missals,"—meaning, of course, some of those MSS. which are remarkable for artistic beauty, but which the applicants, owing to their ignorance of what a *missal* really is, confound with every other class of MSS., although these, as so many among us know, relate to almost every conceivable subject, and are by no means confined to matters theological or ecclesiastical. But even among "experts," so to speak, books are sometimes described as "missals" which are not so. Thus, for example, that celebrated volume which is now in the British Museum, and which is known as the "Bedford Missal," is not *ipso facto* a "missal," but a "Book of Hours," and it is a positive truth that a former keeper of the MSS. was once applied to for leave to copy the illuminated "missiles," which were under his charge, so that he might, had he been maliciously minded enough to have noticed the trifling error in spelling, have appropriately referred the enthusiastic but unorthographic student of the fine art to the armory in the Tower of London. Missals and other ancient service books of the Ancient English Church but rarely occur for public sale. It may be taken as a general rule that they are all extremely valuable, and the "Hereford Missal" is the rarest, and therefore, of course, the most valuable of them all. In the summer of 1858, the British Museum was fortunate enough to add to its treasures a perfect copy of this work, having obtained it from that learned and painstaking writer and collector, Mr. William Maskell, who has prefixed to it the following memorandum in his own handwriting:—"I obtained this volume in the spring of 1858; it had been just found, lying open on the floor in an old house in Bristol, among some hundreds of other books which had belonged to the English Franciscans, and which had been brought by them to England from their convent in Belgium during the troubles of the first French revolution." This unique volume was printed at that famous Rouen press, which produced so many magnificent works between 1485 and 1550.

This particular work was printed in 1502, at the expense of one John Richard, a merchant. After describing the illustrations, Mr. Levien said there is one more point in this Missal upon which I will pause for a few minutes before I conclude, and that is its peculiarity in one of the offices, to which I am sure the ladies, at any rate, will not object to my referring. I allude, of course, to the marriage service. It is to be noted that, although the rest of the book is in Latin, that portion of the interesting but awful ceremony which involves the putting on of the ring and the plighting of the troth is to be said in English, "*in materna linguâ*," as the Rubric has it, "*sacerdote docente*," as if there was to be no mistake about it, and in order that neither of "the high contracting parties" should be able to plead ignorance of the objections by which they were binding themselves, on account of their want of a classical education. As the words in which these obligations were couched, are different from those at present in use, you will, I trust, forgive me for trespassing still further upon your patience by repeating them. The words run thus, "J. N. underfynge ye N. for my wedded wyf for beter for worse for richer for porer yn seknes and yn helthe til deth us departe as holychurche tha hath ordeyned and thereto y same plyteth ye my trowth;" and the bride is to repeat the same words to the bridegroom, substituting, of course, "husband" for "wyf," and adding "to be boxum to ye til deth us depart," &c., so that, although the gentleman might have his fits of "megrims," the lady undertook to be "boxom," *i. e.*, lively and sprightly, till the day of her death. This may possibly have been practicable in "merry England in the olden time," but it would certainly not be deemed compatible with "the rights of women," as they are so strenuously advocated in the nineteenth century.

We must here pull rein. Several other matters might be usefully mentioned, but we cannot afford more space. As it is, our readers will probably admit that we were correct in saying, at starting, that some very good work was done at the Hereford Congress of the British Archæological Association.

WAR AND EDUCATION.

WAR topics naturally occupy public attention almost exclusively. Literature has taken a fiery tinge. The daily journals can find no room for subjects such as, at other times, would command large type. For a few days "the Row" was paralysed; and the weekly issue of new books came to a standstill. In art, in industry, in speculation, every one is pausing for a moment, aghast at the great events which are taking place under our eyes, or waiting for the next telegram.

Without overstepping the prescribed limits of our own columns, or invading the provinces of the periodicals especially devoted to military science, or to military history, there is much which the present campaign forces upon our attention, which lies on ground familiar to our readers. Strategy, tactics, and descriptive literature, we altogether pass by. But the war has already taught, and must yet teach, lessons of the utmost importance, of a more general

nature, as well as some of a nature especially germane to our columns. The architecture of war, or the relation of military science and practice to the works of the builder, has received ample and most important illustration. No less have the mechanics of war been exhibited under a new light; and even of more importance, as deeper and wider in their scope, are those loud and eloquent lessons which speak of the connexion existing between the educational state of a country, and its military prowess and national defence. We have long seen that national wealth would shortly be admitted to be little more than a fraction of the educational state of a country. It now almost seems as if the same might be said of national existence.

With regard to the architectural lessons to be derived from the war, they are, as we write, loud and repeated, although it may well be said that the most signal of them all is as yet unpronounced. In a word, the idea is this. The importance of fortresses is greater than ever. The fortification of towns and cities is a cruel mistake—that is to say, their fortification by walls and ramparts. The fortress that is of vital importance in the stern chess-game of war is a military place pure and simple—a nest for soldiers, placed so as to command a defile, a river, pass, or railway; casemated so as to give cover to its defenders; built on the live rock, so as to set the art of the miner at defiance; provided with water by wells and springs pierced within the very heart of the citadel, so as to be incapable of being cut off by the enemy; walled according to the best methods known to military science, and armed with heavy guns, which, if they attain the at present largest size of 600 pounders, will have four times the calibre of the most powerful siege guns that it is yet practicable to place in the trenches. A properly provisioned and munitioned fortress of this kind, containing a garrison proportionate to the strategical importance of the spot, may be made virtually impregnable, except by famine. With our late improvements in the preparation of food, with the meat extract of the Liebig Company, the Swiss condensed milk, the new German sausages, the best biscuit, and the most carefully-stored grain and flour,—such a fortress might be easily provisioned for three years. Had Metz and Strasbourg been fortresses of this kind, and in this good order, it is more than problematical whether a cautious strategist would have ventured a march on Paris.

On the other hand, the cruel error of attempting to combine city and fortress is pregnantly illustrated in the case of the two great arsenals of Lorraine and of Alsace. Fortified, in his time, by Vauban, and since materially strengthened, furnished with that best of defences, a wet ditch, or series of ditches, in which the water can be raised or lowered by the defenders, these cities were intended to form great offensive centres for warlike operations. The idea that they would have to resist any formidable invasion, is one that no Frenchman would have allowed himself to entertain for a moment. But under actual circumstances, not only has the presence of the large civil population involved suffering of a magnitude which even enemies shrink from inflicting, but the absolute military influence of the presence of so many non-combatants has been in every way prejudicial to the defence. A large garrison is required, greater labour is entailed on every soldier, the points of attack are more numerous and more wide apart, and the provision that might prove ample for the soldiers, shrinks rapidly before the consumption of the inhabitants. The speedy acquisition of Metz has not been a point of strategic importance—that of Strasbourg has; as the railway communication across the Rhine is impeded by its guns. Thus the terrible expedient of bombarding the town itself lay, according to the admitted laws of war, at the discretion of the general commanding the besiegers. It is true that the King of Prussia ordered a procedure which would lay in ashes a town of German origin and history to be suspended, as a striking contrast to the vindictive destruction of Kehl by General Uhrick, and to the malignant melodramatic shame of the shelling of Saarbruck. The point we wish to bring out is, that while the purely military fortress of Phalsburg has held out, to the honour of its garrison, and as an appreciable item in the defence of the country, the mixed character of Strasbourg has caused a great national disaster. Even if the citadel should hold out later than the city, the military loss will have been more, and the military defence weaker, than in the case of a simple fortress, while the fact of drawing fire on a city of 70,000 inhabitants (the main use of the walls of Strasbourg) involves at once a political evil amounting to positive disaster, and an amount of useless human suffering most painful to contemplate.

In fact, the breadth and precision of the line drawn between combatants and non-combatants is not only a redeeming feature of modern warfare of the utmost importance, but it is one on the preservation of which depends the answer to the question whether war, with its new and terrible means of destruction, shall or shall not imply total extermination. Any confusion of the line of demarcation between regular hostilities and murder can lead only to the great increase of the latter. In the confusion of character caused by walling in civilians and soldiers together, nothing is more probable than such a mingling of all occupants and defenders in one indistinguishable mass, as shall lead to total extermination on the success of the siege. And it must be borne in mind that it is a military axiom that the resistance of any place that is not relieved is only a question of time.

The lessons thus terribly taught us have this direct home application. We should make Pembroke our great arsenal, rather than either Portsmouth or Plymouth. At Pembroke the severing of the military and the civil element is and can be more distinctly effected than at any other place of naval importance in the United Kingdom. The few streets of workmen's houses that surround the dockyard might be swept away without any compunction. The immediate defence from the promontory crowning the head of the bay is good. The dockyard is situated at the head of a noble arm of the sea, or inland salt lake, the narrow entrance to which is capable of admirable defence. Within lies the Stack Rock, now fortified, which alone would sink any foeman within the gap. In the harbour the whole navy of England might ride in safety; and on sailing, a vessel is in the open sea in half an hour. In all our systems of defence these great peculiarities should be borne in mind. Very few spots in the world are so fit for a naval centre as Pembroke.

With regard to the mechanics of war, we do not wish to enter at this moment into the military questions of the relative value of the several arms. Our own attention has been long and not unprofitably turned to the subject; and our Snider rifle is a far more effective instrument than either the clumsy Chassepot, or the heavier, but somewhat better finished, needle-gun. It is likely, however, that the latter weapons may better bear being knocked about, and certainly our own rifle requires to be used by a man more handy with his fingers than is needful in order to turn round the bolt-shaped handle of either of the other weapons. But the great mechanical feature of the war has been the service rendered by the railway system. The importance (to which we have just alluded) of any given fort, depends, now in very great measure, on the fact of its command of a railway line. Metz has been turned, in this respect, by the admirable expedient of constructing a temporary line of railway. The advance of the German host has been made at a rate hitherto without any precedent, by the service of the German railways. Distance, in strategy, is measured only by time, and distance has been reduced to a degree which Von Möltke has precisely calculated, but of which we can only say that it must be less than the half of that reckoned in any former calculations. Other mechanical appliances have been pressed into the German service. Traction engines, the enormous power of which we are only beginning to realise in this country, are employed to move heavy guns into position. And captive balloons, although to our surprise they do not seem yet to have been employed, are in preparation. The admirable service of a secret underground telegraph is said to have been discovered, and cut, between Strasbourg and Metz. The field telegraph, for tactical purposes, has, no doubt, been organised as carefully as is now the case with that of our own Royal Engineers. Of the pontoon service we have heard but little, but it is, no doubt, efficient. The increased venom of the engines of death has not been such as to give great advantage to either side. But the command of the railway system has rendered possible an invasion in mass, which the preparation and the provision of border fortresses, properly proportioned, armed, and provisioned, must have, to say the least, materially delayed.

While we can thus already see, with no indistinct vision, some of the lessons which the statesman and the military architect and engineer cannot fail to draw from the terrible experience of our French neighbours, there is yet another which comes with more momentous force to ourselves. We have more than once insisted on the importance of bringing up our national education — in other matters than Latin and Greek—than reading, writing, and arithmetic—or even than the higher mathematics,—to the level of more educating nations. We know, from the reports of our own Education Commissioners, as well as from those of foreigners, that we occupy all but the lowest place in Europe in this respect. In the rapidly evaporating Roman States, indeed, and wherever the priest has his own way, thick and utter darkness is the object successfully attained by what is called education. Next to priest-ridden countries, come professor-ridden countries—or those in which competitive examination is adopted as a test of merit. This has been especially the case in Austria, which is called, *par excellence*, the *pays à l'examen* — an examination country. We are at present cheerfully and contentedly engaged in promoting ourselves from the first of these categories to the second. In France, while very much of the rural part of the country may still come under the sacerdotal extinguisher, there is a great amount of scientific, practical, and industrial education. But, throughout the entire country the schoolmaster has been handicapped. A central impulse has been given which every lyceum or school has been compelled to obey. The first object of the entire and severe course of schooling prescribed to the French boy was to make him a good Imperialist. Hence the terrible inability to look fact in the face, or to serve or save the country, of which each day furnishes such disastrous proof.

Now when we see this one-sided or no-sided education brought into contact with the broad and paternal culture of Germany, the results are even more striking in war than in peace. Of all the Germans round Metz, there was hardly a man who had not an idea of the plan of the campaign. He knew the object of that great silent strategist who had moved king and princes, and *corps d'armée*, like pawns on the board, though he might little understand each individual move. He intelligently received, and faithfully obeyed, orders. He regretted having to leave his home; but, meantime, his life was at the service of his country.

The French army, judging from their own reports as well as from those of English visitants, were in the very opposite position. Not a map of the seat of war was to be seen. Even the officers pent up in Metz thought that they were brought to the front to defend that city The soldiers thought nothing, except that they were betrayed. They formed a class apart from the officers, though the latter rise from the ranks. They mistrusted them, and even fired upon them, and, if we can believe but the half of the tales of plunder, conceited ignorance, and utter carelessness that we hear of, marshals, generals, and even subalterns, driving luxuriously to war, as to a promenade, in the rear of their regiments, we can hardly wonder at it. Thus the educated and uneducated army, the armed nation, and the paid machine, came in collision. With what result?

Since the introduction of mercenary troops into warfare first spread from the example of the ever-contending Italian States, the great question of the natural relation between the army and the nation, between the State and its armed means of defence, has not only been a study for the statesman, but a problem involving very shifting and inconsistent elements. Into that long and interesting history it is unnecessary here to enter. The last case of the problem has now received a solution so decisive that none who regard the matter from the scientific point of view can hesitate as to the import of the facts.

The two opposing forms in which military defence is organised (or is thought to be organised) by modern civilisation have been brought face to face. The balance has never for an instant wavered. And although in the scale that has kicked the beam it is easy, after the event, to recognise certain elements of failure, that may be thought foreign to the question of principle, it may yet be seen that, for the introduction of these foreign and disastrous elements there has, practically, been found ample room in one system, and little or none in the other.

On the one hand, we have seen a professional army, reckoned, less than three months since, not only the finest in the world, but the finest that had ever been seen in the world. This army

was permanent, mercenary,—raised, indeed, not by voluntary enlistment, but by conscription, yet possessing an *esprit de corps* that very rapidly transformed the conscript into the soldier. To the perfection and the brilliancy of this great military engine the resources of a nation of thirty-seven millions and a half of people were freely consecrated. It was the first object of the French Budget, the chief pride of every Frenchman. Not only was the army petted, not to say pampered, as the *élite* of the nation, but it was formed on the principle of giving disproportionate value to picked corps, as compared with the great arm of most great generals, the infantry. Such was the prestige of this army, such the amount devoted to its production and maintenance, to its terrible and secret artillery, and to its brilliant guard, cuirassiers, and "dusk faces with white silken turbans wreathed,"—that we are told that an English Cabinet Minister declared his belief that it would be in Berlin within three weeks from the time that its leader threw down the gauntlet.

In opposition to this *chef d'œuvre* of the prætorian system was an army of altogether different organisation. It was one formed on the old-fashioned principle that every man is the natural defender of his own hearth, and that, in case of need, he is bound to pay, not only in purse but in person, the cost of that defence. Having known what invasion was, and having drained the bitter cup to the very dregs, the Germans betook themselves to prepare a mode of prevention, with that same patient, steady, unflagging, undemonstrative, successful energy which a phlegmatic and resolute race have brought to bear on so many difficult problems of her vital interest. If the nation could but be prepared to rise in arms as one man, or rather as a succession of men, advancing decade after decade, the standing army that they would require would be only such as was needful to keep up the *cadres* of the organisation, and to educate the lads who, year after year, arrived at the age of military discipline.

So admirably was this great system ordered, so ample were the preparations of the heavy and costly material of war, so prompt and effective the means of transit, that at the first great call, when the wolf was indeed coming, the mighty engine started without a check. Peasants and nobles, learned men, wealthy men, busy men, walked rapidly and quietly to their nearest depôt. They came out armed and in uniform, in bodies that flowed, like contributing rivers, to the frontier.

The one grand advantage supposed to be possessed by the standing army was its instantaneous capacity for movement. The trumpet had but to be blown, and the troops were on the march. For the concentration of the citizen army, on the other hand, a certain delay was unavoidable. It entered into the calculations of the strategist. Each day, from the date of the order to arm, brought two army divisions to the standard. But it so turned out that the machine that was to be ready for instantaneous service was out of gear. The professional army did not work, and the citizen army did.

It does not follow that a standing army is necessarily a source of private plunder. But it is no less certain that the prætorian troops, which were thought the finest in the world, have thus failed at the hour of need. It cannot be urged, henceforth, that the vast expense of a standing army gives a reliable safeguard to a great country. The evidence, so far as it goes, is the other way. And it is clear that a well-ordered citizen army can be raised, and armed, and sent to the point of danger with a celerity hitherto undreamed of.

We cannot but believe that the German system will, for the future, be the European system. That there will be many to deprecate its introduction into this country we do not doubt. It is a strong characteristic of the Englishman to resist improvement to the last hour, and then to effect it with more haste than good speed.

But apart from the domestic question, we trace in the grand German crusades an augury for the future education of the world. To take every lad, before either stature, or gait, or habit, is formed (often boorishly formed), and, as soon as he is able to endure a certain amount of hardship without checking his growth, to give him an education at once physical and moral,—to teach him to march, to ride, to fire, daily to pass many precious hours in the free open air, and even more than this,—to give him habits of order, of precision, of cleanliness, of truth; to teach him how to obey, and thus how to command; to tell him practically that he is a citizen, and that he has duties that he owes to his country; and to redeem him, at this critical age, at once from idle frivolity and from the prematurely contracting pursuit of gain,—this will be a gain for the future generations of Europe not unworthy of the blood that has been shed to acquire the lesson. Nor is there any reason why the education of the soldier citizen of the future should be physical and martial alone. The State is responsible for bestowing the best cultivation on the youth whom she organises as the seed-plots of her armies. The finest education given in this country is (or rather was, before recent changes) that of the Royal Military Academy at Woolwich. Five terms of that wholesome discipline converted the pale and over-worked schoolboy (for all had to work in order to pass the barrier of Chelsea) into the vigorous, healthy, well-taught, reliable soldier. The battle of Sedan means that we shall not allow Switzerland and Germany to remain the only free countries that educate their youth for all the duties of grave and martial manhood. It means that every boy in Europe shall, sooner or later, be taught how best to become a man. The cad will, under the good influence of the drill-sergeant, attain some title to self-respect, in learning to respect his superiors. "Peace it bodes, and a quiet home, and successful rule, and due supremacy;" and we may hope that peace will be more likely when war is no longer a trade, but is regarded as either the "worst of crimes or the most sacred of duties."

ARCHITECTURE AND NATIONAL POLITY.

MOST of our readers probably found a good deal to interest them in the detailed description of the celebrated Taj-Mahal sepulchre at Agra, recently reprinted [in our columns, from a paper read at a meeting of the Institute of British Architects, by an English architect whose professional occupations had taken him to the East for a time. Did it occur to those, however, who may have followed with interest the account of the impression produced on the eye of a northern architect by the actual inspection of one of the most beautiful and characteristic specimens of the architecture which has grown up under a tropical sun—of fountains and flowers, of marble radiant in the dazzling glare, of cool green shadows and inlaid gem work—did those who tried to picture to themselves the fairy-like *tout ensemble* take due note also of a statement, made incidentally in the course of the description, as to the means whereby the work was carried out. We re-quote the short sentence referred to:—

"The whole cost is said to have been about three millions of our money. It took seventeen years in building, *and the labour was all forced*, the workmen being kept on a daily allowance of rice."

This is not so fascinating as some of the other details mentioned in connexion with the Taj-Mahal, nor is it strictly an architectural detail at all; and yet such a statement suggests considerations of no slight import with regard to the past and future progress of architecture as a national art. Assuming its historical correctness, it certainly falls in singularly as a corroboration of the reflections which the consideration of some of the great architectural monuments of Egypt suggested to me of the most brilliant and comprehensive intellects of modern England, too early lost to us. Those who are acquainted with that remarkable fragment of a "History of Civilisation," in which Buckle made the attempt to generalise all history under one great law, will perhaps have already recalled the passage with which we ask leave to cap Mr. Emerson's short and bare statement of fact:—

"The mere appearance of those huge and costly buildings which are still standing, is a proof of the state of the nation that erected them. To raise structures so stupendous, and yet so useless, there must have been tyranny on the part of the rulers and slavery on the part of the people. No wealth, however great, no expenditure, however lavish, could meet the expense which would have been incurred, if they had been the work of free men, who received for their labour a fair and honest reward. But in Egypt, as in India, such things were little regarded, because everything tended to favour the upper ranks of society, and depress the lower. Between the two there was an immense and impassable gap. . . . The people at large were little better than beasts of burden, and all that was expected from them was an unremitting and unrequited labour. . . . Hence it was that, the industry of the whole nation being at the command of a small part of it, there arose those vast edifices, which inconsiderate persons admire as a proof of civilisation, but which in reality are the evidence of a state of things altogether depraved and unhealthy."

Here we see that the conclusion deduced by the philosophic historian as to the political and social state of one nation, from the aspect of buildings erected at a time concerning which we have little historic records, agrees remarkably with the known facts connected with the erection of a building with a similar object, in a country very similarly situated, at a period comparatively near to our own. For, despite the vast difference, architecturally and artistically, between the Pyramids in Egypt and the Taj-Mahal in India, the object of both was the same, viz., the glorification after death of individuals who had been marked out from their fellow men mainly by the hereditary succession to dynastic rule, who regarded themselves, and were regarded by others, as beings set apart to be honoured and obeyed with unquestioning submission by every one around them, and who therefore were only exercising their natural and admitted rights in compelling from others, *bon gré mal gré*, as much labour as they wanted for any object which might seem good to them. There is no civilised quarter of the earth where such an idea of the rights and duties of government would not now be, openly at least, repudiated; and the tendency of things everywhere is more and more towards an open labour-market and free choice and action on the part of the labouring class. But, if Buckle's theory as to the relation between great buildings and compelled labour be held as of general application, the progress towards greater liberty and equality must then, it would seem, be necessarily a progress adverse to the production of great architectural monuments, and so far therefore entailing on us at least one loss as against its immense social and humanitarian gains. In what degree, and under what reservation, would such an apprehension be a just one?

The gist of the question lies very much in the meaning which we attach in this case to the word "useless." We are apt to say that a thing is useless when it can subserve no practical need, no purpose or part in the outward machinery of life. But in this sense all architecture is more or less "useless," since it is almost of the very essence of architecture, artistically considered, that it should involve a stepping beyond the mere hard necessities of practical requirements, should consist in the beautifying of what might, without any such illustration, be equally "useful," though unsightly. And so long as there are any persons in existence to whom the sight of a beautiful architectural design is a source of high pleasure, so long it would be impossible that we could call any building which fulfilled this condition "useless" in the widest sense of the word, of no value to any one, however little practical purpose it might serve, however small its rentable value. Only such structures as the Egyptian pyramids, of great cost, of no beauty, architecturally, and serving only to gratify a vain and shadowy ambition on the part of an individual, could with full truth be spoken of as "stupendous and yet useless." A building which, like the Taj-Mahal, is a contribution to the sum of artistic beauty on the earth, is so far to be judged on different grounds. No one, at all events, regrets now the fact of its existence. And yet buildings of this class are, in one sense, illustrations of the fact that architecture of the most purely ornamental and (if we may use the expression) sentimental character has generally flourished more luxuriantly under a despotism of one sort or another, than in a free and independent society; that it has shown more affinity for the feudal than for the federal type of institutions. When those who build have to pay, and are willing to pay, honestly, the market price for the labour and material wanted, there are always prudential considerations to weigh against the desire for architectural grandeur, and the latter will always be in rather under than over the due proportion to the actual necessities of the building. To put these considerations entirely or in any great measure in abeyance, one or other of two conditions must be presupposed. Either the builder or builders must have power to compel labour and wealth to their own ends; or they must be possessed by an abnormal enthusiasm which will render them indifferent to expenditure. Of the first case such a building as the Taj-Mahal is a notable instance. Despite its exceptional beauty, it could at the time have had no interest or value, probably, except for the king whose whim it was to build it, and perhaps for the architect who looked for lasting fame through its means. To the workmen employed on it the building was probably an unmitigated "bore," or something

worse. And coming to less extreme cases of despotism than those of Egypt and India, it is not difficult to see that wherever such a degree of irresponsible power exists as to render possible something like compulsory or unchecked taxation, there is an opportunity, pretty sure to be exercised, of indulging in architectural splendour, the readiest way, indeed, for a dynastic rule to give outward evidence of its power and grandeur. Hence the baths and palaces of Imperial Rome, the halls and terraces of Versailles; hence, too, may we not aptly say, such works as the *ex*-Imperial opera-house of Paris, a building of which, with its reckless and even inartistic extravagances of meretricious ornament, and overgrown saloons and staircases, it may be safely said that it never would have been erected under any Republican or fairly Representative form of Government, any more than would the Boulevard "de la Dette," *né* "Haussman." And of the second influence mentioned, the great development of Mediæval church architecture of course affords the most notable instance. It was not merely an architectural enthusiasm which erected the great naves and towers and façades of our cathedrals, and the spires of our village churches. The nation was under what might be called a spiritual despotism (not using the word in an offensive sense), and the outward visible sign of righteousness was the erection of churches. It is only the recognition of this state of feeling which can enable us, even within our own country, to account for the disproportionate number and size of the churches in such districts as what were then the fens of Lincolnshire, and in parts of Norfolk and Suffolk; places where there is not now, and never could have been, population sufficient to practically require the grand churches which were erected in such profusion in the midst of such a neighbourhood. How, in the head-quarters of Mediæval Christianity, the Roman Pontiffs drew to their service all that was best, for many generations, of the art-power of Southern Europe we need remind no one.

There is this to be said, again, in explanation of the affinity hitherto existing between despotisms, spiritual and temporal, and the achievement of architectural grandeur, that under such political conditions the power of erecting buildings, or causing them to be erected, has rested mainly with those who, by their peculiar advantages of education and position, were more open than others to the impressions produced by architectural splendour and refinement. The clergy, of course, were, in the Middle Ages, almost the monopolists of intellectual cultivation, and the inheritors of regal power are commonly within reach of the best education in matters of taste which their time and country has to offer;* and it has been only too often proved that a very high degree of cultivation and refinement of perception may co-exist with the basest vices, and even with the most heartless tyranny. As we come to distribute political power more, especially the highly-important power of pulling at the purse-strings, we necessarily bring into play a number of (æsthetically) grosser natures, whose only notion of art is that it is something that costs a good deal of money, and brings them no practical return. Republics, including our own short-lived one, have almost always been unfavourable to the development of art on a grand scale; and even in our present representative assembly, we had occasion to notice some time since the palpable and openly-expressed "art-phobia" which aired itself during a discussion as to the New Law Courts. Is this, then, a necessary consequence, inherent in the nature of things? Are we to expect nothing better than that the more we invite "the people" to self-government, the more will our chance for grand architecture be diminished? The two moving causes already mentioned, and hitherto so efficacious in making opportunities for architectural display, have pretty well passed away from us; monarchy can indulge in few palatial dreams in the face of a Committee of Supply; and the ecclesiastical idea, in spite of recent revival, has nothing like its old influence — *stat nominis umbra*. What will be the power, what the enthusiasm, which will yet once more raise us above the propensity to calculate too closely the cost when opportunities arrive for the development of new architectural schemes? The only one we know of is that which will assuredly gain power amongst us—very slowly probably in this country, but not less certainly—namely, the love of what is beautiful and noble in architecture, as in other things, simply and purely for its own sake. The gradual shifting and dilution of political power from the hands of a few into those of the nation at large must necessarily have its effect upon architecture, in causing that art to be exhibited less in isolated specimens of palatial or ecclesiastical splendour, more in the diffused form of street architecture and of public works, where utility must always be the basis of beauty. At present utility has the upper hand altogether in such matters, and will have until the middle and lower classes of this country come to look on the matter in a very different light to that in which they are now capable of seeing it. That sympathy with the nobler and more ornate forms of buildings which has hitherto been very much confined to special classes and professions, we must see extending itself among the people at large. The progress will be slow, as we said: for as the mind can only enjoy what it has acquired the power of apprehending, a very different state of national education must supervene before national art can come to much, or be regarded as something worth paying freely for. But the innate desire to beautify life must assert itself with every advance in mental cultivation; and under such considerations, we may, perhaps, say that one of the most hopeful auguries for the ultimate future of our national architecture has been the recent passing of the Government Education Bill.

* Since the above remarks were written, we notice a passage in Viollet-le-Duc's "Dictionnaire," which bears remarkably on this subject. Speaking of the genesis of the true French Gothic style, he observes that during the period of independent religious and baronial feudalism, the national architecture had wanted unity and a centre point to start from:—"Mais, quand l'unité du pouvoir monarchique commença de s'établir, cette unité, secondée par des artistes laïques faisant partie de corporations reconnues, dut, par la force naturelle des choses, former un centre d'art qui allait rayonner de tous côtés en même temps que son action politique. . . . A partir du XIIIe siècle l'architecture suit pas à pas les progrès du pouvoir royal, elle l'accompagne, elle semble faire partie de ses prérogatives; elle se développe avec énergie là où ce pouvoir est fort, incontesté; elle est mélangée et ses formes sont incertaines là où ce pouvoir est faible et contesté."

ON THE CONSTRUCTION OF SEWERS IN RUNNING SAND.*

ALL who have had experience in engineering are aware that the most valuable knowledge is often that acquired while contending with unforeseen difficulties. The introduction of the present subject to the notice of the British Association will therefore, we hope, require no apology beyond the simple statement that some of the sewerage works intrusted to us having been executed in difficult, sandy ground, we are desirous of recording for the use of others some of the experience necessarily obtained.

Probably no one who has not watched the process of laying sewers in ground similar to that which distinguishes the land on the Liverpool, Crosby, and Southport Railway, the whole distance from Waterloo to Southport, can form any idea of the difficulties that have to be encountered. The whole of that district is one mass of sand, resting on a bed of moss and marl, varying from 10 ft. to 20 ft. deep below the surface, and having no natural drainage (in consequence of the elevation of the shore line of sand-hills), in wet seasons in the lower portions, or slacks, flushes of water form. The permanent water-level in the dryest seasons in these places is only a few feet below the surface; while, sink where you will, before you get to the depth necessary for a sewer you are sure to come to water. Now water in gravel or rock is not difficult to contend against, but in fine-blown sand it forms a subsoil of running sand or quicksand of the most lively and insinuating description. Sheet, pile, or trench as you may, it reams in between the sheeting in streams of sand, and also forces itself bodily upwards in the bottom of the trench by a species of disguised hydrostatic pressure. To keep open more than a short length of trench the full depth during the laying of the pipes is impossible, and consequently the difficulty of laying the invert of the sewer to a true gradient is immensely increased, while the low gradients demanded by the general flatness of the country require, for the efficiency of the sewers, extreme accuracy. When practical, in order to relieve the ground of water, it is advisable we find, when it can be done without timbering, to open out a long length of cutting, about 5 ft. or 6 ft. deep, beyond where the pipes are actually being laid.

* From a paper by Messrs. Reade & Goodison, read before the Mechanical Section of the British Association, by Mr. T. M. Reade.

In our works, from motives of economy and other reasons, we have most used pipe sewers, socketed, glazed, and jointed in fine cement. Theoretically, such pipes, with cement joints, should form impervious sewers, but they do not; with the ordinary system of laying we know this to be impossible. The consequence is, that where you have several miles of pipes the subsoil water that enters the sewers is enormous. Summer or winter the flow is unceasing; nor is this in itself a disadvantage, but rather the contrary, for the tendency of the flow is to keep the sewer sweet and clean. The Blundellsands main sewer, which with subsidiary sewers is about two miles and a half long, in dry frosty weather last winter, when gauged, showed a discharge of 180 gallons per minute, three-fourths of which would at least be subsoil water; and apparently, except during rain, the flow does not materially differ at various seasons. This, then, as far as the water is concerned, is a distinct advantage; but along with the water sand reams in and forms a deposit along the whole length of the sewer, which is only removed by frequent flushing. In every case where pipes are laid in running sand, however well and carefully the joints are made, we find this to occur. To get the cement to set before being washed into the sewer is no easy matter.

In laying the pipes, about twenty yards of timbered trench are opened at one time. A dam of sods, &c., is then formed across it in front of the pipes, and the sand between it and the pipes is dug out until a hole is formed from which the water can be baled out into the trench above, from which it is pumped to the surface. When all is prepared, the pipes are lowered down into the trench one by one, the joints being laid on a bed of clay puddle, 6 in. thick; the joints are then made good with quick-setting cement, and the cement is then covered all round with a good collar of clay puddle, to prevent it being washed into the sewer. With very great care and judgment a good sewer may thus be formed, but not a water-tight one, and we always find that the subsoil is drained nearly to the level of the invert in the very best and most carefully-constructed sewer we have yet seen. This in itself is a positive advantage; but the consequent admission of running sand,—and it is astonishing how fine an opening it will ream through,—is an evil which it would be well, if possible, to guard against. In addition to this, the sinking of the baling-out hole while laying the pipes has a tendency to draw the end pipes downwards, and thus interfere with the true gradient of the sewers. In all sewers in a ground of this nature we have also to form what is called a sumphole at the bottom of each manhole, or they would speedily get choked. By the aid of the flushing apparatus, which we shall presently describe, the deposit in the sewers is flushed into these sumpholes, and then cleaned out at intervals.

Though sewers are possible and effective, laid in the manner just described, it is a matter of much care and attention to get them laid properly, and it is really essential that a clerk of works should himself see every individual pipe laid. With all this, still imperfect joints occur; for as soon as the baling out ceases, as the pipes are practically plugged up with a straw plug, which is drawn through the sewer to keep it clean, the level of the water rises sometimes even above the top of the pipes, and the hydraulic pressure thus created will find out all imperfections, and sometimes prevent the cement setting properly. Again, in putting in the sumpholes, the tendency is to draw the nearest pipes out of level, and, indeed, the most satisfactory way of getting them in is to sheet-pile them all round. Having had all these manifold difficulties to encounter, we set ourselves to try and devise some method by which greater care in and perfection of laying could be obtained.

The subsoil drain and pipe rest we have invented is partially the result of our experience in laying sewers in sand. At our suggestion, Messrs. Brooke & Son, of Huddersfield, the fire-clay pipe manufacturers, have worked out the invention in a practical form; and we are now commencing to use it in the sewerage works at Birkdale. The primary object of attainment is this, to get a dry subsoil wherein to lay the pipes that the cement joints may have time to set and become watertight; and, by securing more time for the laying of the pipes, laying a greater length at a time, and the prevention of disturbance or drawing of the pipes while preparing the next excavations to ensure greater certainty and perfection in the gradients and

junctions, and consequently improve the general system of pipe sewerage. That this is of the utmost importance none who practically understand the subject can doubt; for the difference between brick sewers and pipes often means whether sanitary work can go on or be stopped.

The subsoil drain is in internal section a semicircle, and varies in diameter according to the diameter of the superimposed sewers; for 2-ft. pipes we purpose using drains 1 ft. diameter; for 1 ft. 6 in., 9 in. diameter; and for 1 ft., 6 in. diameter. The length is the same as the pipes in the sewer, that is, either 2 ft. or 3 ft., as the case may be. The larger pipes we use in 2 ft. 6 in. lengths. Each pipe is socketed, and the sides being brought up square a shoulder is formed, on which the moveable bricks forming the rest, which also fit the top of the drains and the curvature of the pipes, are laid. The pipes in the sewer above are arranged so that they break joint with the subsoil drains, and the ends of each sewer-pipe rest on the adjoining subsoil pipes. It will be seen that this arrangement secures ample space under the sewer for making the cement joints good.

The operation of laying the subsoil drains is somewhat similar to that previously described as the mode we adopted for laying pipe sewers before employing this invention, the only difference being that the joints are made in clay alone, and from the small size of the pipes they can be handled and laid much more readily; slight imperfections in the gradients also will not be of the same consequence as in the sewers. When a sufficient length is opened out we commence laying the sewer pipes upon the brick saddles or rests, which have previously been accurately laid to the proper levels from sight rails in the usual manner. As this can be done without hurry or confusion a more perfect sewer is the result.

The subsoil drains are continued through some of the manholes, and are united to the main sewer at intervals, discharging their contents into sumpholes, which retain the sand that may be brought down by the water, and which then can be readily cleaned out when necessary. In each of the intermediate manholes where the subsoil drains are carried through, they will be fitted with a disc plug on the top for the purpose of flushing.

When the flushing valves, to be hereafter described, are down, the removal of any of these disc plugs will allow of any portion of the drain being flushed with a good head of water.

It will thus be seen that while we retain all the advantage of subsoil water, we avoid the evils of running sand, which, if not attended to, accumulates in the bottom of the sewer, cakes with the sewage matter, and obstructs the flow. Perhaps some may think it would be better to keep the flow of subsoil water entirely separate from the sewage, by continuing the drains through or round all the manholes, with provision for admitting the subsoil water into the sewers wherever required for flushing. Special cases undoubtedly require special treatment, and in the case of wet gravelly ground it may sometimes be an advantage when using the subsoil drains to carry out a separate system; but in running sand the case is different, for without a certain number of sumpholes the drains would infallibly get choked, and to fit the subsoil drains with separate manholes and sumpholes would unnecessarily complicate the sewerage works, besides introducing other evils. As a rule, we are in favour of introducing subsoil waters into sewers, as a constant flow tends to sanitary efficiency; but where the sewage is to be used for irrigation, it may in some cases render it difficult to dispose of the whole of the sewage, especially where pumping has to be resorted to. There are, however, to our mind, so many objections to a separate system, that we should not adopt one, except for very special reasons.

None can lay down rules and formulæ for inflexible guidance in engineering matters. All that can be done is to state principles, and the intelligence of the engineer must be his guide in their application.

Though primarily, the object sought in the mention of the subsoil drain and pipe rest was the more perfect construction of the sewer proper, it possesses the additional merit of reducing the permanent level of the subsoil water to a lower level than does the ordinary sewer, and is a distinct provision for that object instead of an accidental accompaniment of sewerage works.

Brick sewers it is common to construct with invert blocks, when the subsoil is wet, and they make a very true foundation to build the sewer upon. In running sand we find it very much better to construct the inverts with flanges, and to bed them in clay, as a precautionary measure for keeping the sand out of the sewer. After the sewer is completed, it is unnecessary to keep the invert drain open, as the brick sewer, being porous, admits the subsoil water, and effectually drains the ground. During the construction of the sewer the invert blocks act as subsoil drains, and very much facilitate the work.

The experiments we have already made with the subsoil drains have thoroughly satisfied us as to their efficiency. We find that when they are laid, the sewer can be constructed with extreme facility with perfect joints, and that the effect of the sewer-pipes breaking joints with the sub-drain is not only to strengthen the sewer at the joints and prevent drawing, but to ensure perfection in the gradients. The subsoil drains are, in fact, a foundation for the pipes of the sewer, and the sewer itself can be as readily constructed upon them as if the ground were perfectly dry. Those who have had experience in running sand will see this is no small advantage, independently of the draining of the subsoil which will necessarily occur.

We have begun to use the subsoil drains, or "blocks," as the workmen already call them, in the sewerage works we are carrying out at Birkdale, and when by their aid we get the 10,000 yards of intended pipe-sewers completed, we shall be in a position to state the results, and to give further information to any engineers who may ask for it.

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The conditions of perfect sewerage may be summed up thus: true gradients, as quick as can be obtained, but increasing gradually from the outlet to the branch sewers; perfect construction; requisite depth below the surface; provision for draining the subsoil water to the level of the sewers; adequate flow of water in the sewers; abundance of flushing power; constant flushing and sufficient ventilation; and real active supervision in the executive. But above and beyond that, the abolition of cesspools, middens, and stagnant pools, together with a perfect house-drainage, are essential. Often, when sewerage works are completed, the whole of their utility in a sanitary point of view is vitiated by criminal neglect of the house-drainage. It is not merely sufficient to connect existing drains or the overflows of cesspools with the sewers; they should be thoroughly examined, abolished, and the drainage reconstructed where necessary. We have no doubt that defective house-drainage is in most cases responsible for local outbreaks of fever and other diseases rather than the main sewers.

CONSTRUCTION OF OVENS.

A CORRESPONDENT sends the following notes on the construction of modern ovens:—They are built of various sizes, from what are called four-bushel ovens to ten bushels. A good-sized oven, to hold 140 or 150 loaves, is 11 ft. by 9 ft. Particular care is always observed in these proportions, as deviation makes a great difference. We have seen ovens erected for certain departments in the Government of this country by very clever clerks of the works, who adapt an oven to bake a certain quantity of bread to the place they build it in, and not the place to the oven. Great care must also be exercised in the construction of the flue. The floor being laid in concrete, with tiles on it, a flat arch is turned over with small bricks, which arch is brought from the four sides to a point in the centre. At one end is an opening for a door, generally 2 ft. by 14 in. At either side of the door, forming the corner of the oven, is an opening which contains the fire, and the opposite corner an opening to the flue, which flue, when it cannot be carried immediately up from the oven, and has to traverse a longitudinal space, should be three times in perpendicular height to its length, and terminating at top with a bell-mouthed opening.

Some slight innovations in the construction of the fireplace have been made from time to time, for the saving of fuel and prevention of smoke. When a batch of bread is required to be baked a fire is lighted, the flue damper is opened, and as soon as the oven is properly cleared of smoke, the time will depend upon the quality of coal employed, also the state of the atmosphere. The best and most economical plan is never to let the fire out, always keeping a clear coke fire in the grate. When properly heated, the oven should be as free as possible from soot; if soot hangs about the roof and sides it indicates that the flue wants sweeping, or there is something wrong in it. It is best to rather over-heat it, and let it cool. When the dough is ready, an iron stopper is placed against the opening of the fireplace, the furnace-doors shut, and the flue damper closed. Some pieces of oak wood, called *bailes*, are placed against the sides, the floor properly swept, and the bread placed in. The heat of the oven should be from 444 deg. Fahr. to 450 deg. In two hours (if quartern loaves), the bread is ready, having lost one-tenth of its weight. When the bread is taken out of the oven it is left to cool, and a further loss of weight occurs: the loss at this period depends upon the skill and manipulation of the workman, and the ingredients he employs.

If the floor of the oven is too hot, it will give too thick a bottom crust; the contrary, if the roof is too hot. A good workman will tell the difference immediately, by his hand; to an unskilled person a piece of paper is the best test: held midway between the floor and roof, it will soon show from which the heat comes. The use of a long mop formed of pieces of old woollen cloth, called a *devil*, dipped into water, is the best remedy for this. Flour thrown into the oven is also used, but it is a bad criterion; old flour will get quite black, when new flour will not brown. We have stated that the time of heating depends upon the quality of coal. Having tried the various kinds of coal in the three kingdoms, having visited and inspected a baker's oven in every town of the three kingdoms and the Channel Islands, for the purpose of ascertaining the quality, a slow-burning coal of a bright flame is the best, not a *swift*-burning coal, as most encyclopedists state. From the result of a large number of trials in a properly-constructed oven, we find that a mixture of Silkstone and Newcastle coal is the best, or, in other words, two-thirds *non-bituminous* to one-third *bituminous*.

THE LADY'S BOWER.

SIR,—With reference to Mr. Godwin's suggestion as to the "*Lady's Bower*" at Hereford, perhaps you are not aware that most Catholics in their houses have a small room which is used as an oratory, and during the month of May, or, as we call it, in religion, *the Month of Mary*, this oratory is frequently fitted up as a *Bower*, with a statue of "*Our Lady*" *enthroned*. Hence "Our Lady's Bower." A.

VALUE OF PROPERTY.

Penrith.—Mr. Jackson, auctioneer, introduced for competition the Brackenbrough estates, situate in the parishes of Hesket, Hutton, and Lazonby. The estate of Brackenbrough and the four farms adjoining, containing in all 896a. 2r. 22p., were at first offered in one lot, and were bid for to 31,000*l*. The lots were then tried in detail, the Brackenborough Farm, consisting of 358a. 3r., being first put in competition, without, however, meeting with any response. Blacksykes Farm, consisting of 103a. 3r. 20p., was then tried; and, failing to command more than 4,000*l*., was withdrawn. For Robinson House Farm, 114a. 3r. 13p., there was no offer; and Kitty House Farm, 30a. 0r. 5p., was bid for to 1,020*l*., but this sum falling short of the value placed upon the property by the vendor, no sale was declared. The Low Grounds Farm, comprising 289a. 0r. 24p., was next put up. This property is of freehold tenure, but, after being run up to 10,600*l*., was withdrawn. The estate and farms were again submitted in a lump. The auctioneer said it was no use delaying, and he might as well intimate that the reserve price was 37,500*l*. Mr. Murray, of London, immediately bid 100*l*. more, and the estate and farms were knocked down to him.

Colchester.—The following properties were sold by auction by Mr. Edward Smith, at the Red Lion Hotel:—The Weathercock Farm, West Mersea, consisting of 125a. of arable and grass lands, chiefly freehold, with residence and agricultural buildings, together with two cottages, was disposed of to Mr. James Brown, for 6,625*l*.

Kempsey.—Messrs. Hobbs offered for sale, at the Crown Inn, Kempsey, some freehold investments at Broomhall, Kempsey. The property was divided into two lots, the first of which, that of The Lower Broomhall, comprising 20a. 3r. 15p. of arable and pasture land, fetching 1,480*l*.; and lot 2, comprising 8a. 1r. 32p. and known as Capell's Hills, realising 710*l*.

Carlisle.—Mr. C. P. Hardy, auctioneer, offered for sale the Howard Arms Inn, Lowther-street, together with all its accessories, and a grocer's warehouse adjoining; also two dwelling-houses, Nos. 18 and 20, Lowther-street, in the occupation of Mr. John Norman and Mr. Henry Hill; a shop and dwelling-house, No. 14, Lowther-street, in the occupation of Mrs. Matthews; and four cottages in Key's-lane. The total rent of the property is 124*l.* 17*s.* Ultimately the reserve price was declared to be 2,000*l.*, and Mr. Hardy said an advance on that sum would insure a sale. Mr. Hodgkinson, after some time, offered 5*l.* over the reserve, and the property was knocked down to him.

Malvern.—Messrs. Bentley & Hill sold several lots of freehold building land at Malvern. Lot 1. A valuable piece of freehold building land, free from land-tax, fronting the main road from Cradley to Great Malvern, and adjoining the Cowleigh Park Hotel, adapted for the erection of a villa residence, and containing 1,210 square yards, 90*l.* Lot 2. Land fronting the above road, and also fronting a newly-made road leading to Great Malvern and the Link Railway Station, suitable for the erection of a first-class villa residence, and containing 2,147 square yards, 210*l.* Lot 3. Land opposite to the last lot, and containing 1,260 square yards, 150*l.* Lot 6. A plot of land in North Malvern, containing 1,210 square yards, 170*l.* Lot 13. Containing 1,000 square yards, situated opposite the Malvern Rural Hospital, 95*l.*

Rochester.—A sale of freehold land and dwelling-houses, by Messrs. Cobb, took place at the Bull Hotel, Rochester. Lot 1, house and 12 acres of land, freehold; 1,120*l.* offered; this did not reach the reserve price, and therefore the lot was not sold. Lot 2, freehold field of 3 acres of land, sold for 220*l.* Lot 3, "Burnt House Field," 8*a.* 2*r.* 18*p.* of arable land, sold for 650*l.* Lot 4, the "Malthouse" cottages, and gardens, containing 9*a.* 1*r.* 36*p.*, sold for 850*l.* Lot 5, two enclosures of marsh land, 9*a.* 0*r.* 4*p.*, sold for 500*l.* Lot 6, rich marsh land, 2*a.* 1*r.* 37*p.*, sold for 120*l.* Lot 7, marsh land, 5*a.* 1*r.* 13*p.*, sold for 240*l.* Lot 8, the Burnt House Farm," in the parish of High Halstow, containing 32*a.* 2*r.* 34*p.*, sold for 1,270*l.*

Ombersley.—At Hadley Bowling-green, Mr. Nathaniel Taylor, auctioneer, submitted to public competition a small freehold estate, consisting of a house, outbuildings, and nearly four acres of land (all pasture), let at 30*l.* per annum, situate at Chatley, in the parish of Ombersley. The property was knocked down for 710*l.*

FROM AUSTRALASIA.

Melbourne.—The friendly societies of Emerald Hill have joined together for the purpose of supplying a want long felt there; viz., a large hall in which to hold public meetings and balls, and for the use of the different lodges. The matter was left in the hands of delegates, who called for competitive designs, the one selected being by Mr. Geo. R. Johnson, and which forms the subject of an engraving in the *Australian Illustrated News*. The design provides on the ground-floor to the Coventry-street front two shops, 21 ft. by 17 ft. 6 in. Connected with each on the various floors are parlour, bedrooms, kitchen, and a spacious cellar, same size as shops. In rear of the shops are ladies' and gentlemen's retiring-rooms, fitted up with lavatories; refreshment saloon, 50 ft. by 18 ft. 6 in.; two committee-rooms, 21 ft. by 21 ft. 6 in.; and the remainder of the site is taken up by the dispensary, with dispenser's quarters, hall-keeper's quarters, and a large store cellar, connected with large hall by a trap-door, for storage of forms, &c. The first floor, towards Coventry-street, is occupied by suites of offices. In the rear is the large hall, 100 ft. by 50 ft. This is fitted at one end with stage and proscenium, under which, on a mezzanine floor, are two green rooms; at the other end is a gallery. The upper floor is entirely occupied by two large lodge-rooms, 31 ft. 6 in. by 27 ft. 3 in., with ante-rooms, store-rooms for regalia, &c. Attention has been paid to the mode of exit in case of fire, there being four staircases available in such an emergency. The design is in the Venetian Palazzo style of architecture. Tenders have been got for the erection, the lowest being 8,000*l.*

The works in connexion with the Graving Dock at Williamstown, which have remained at a standstill for two months, are now to be resumed. They were suspended in consequence of a strike amongst the workmen, who demanded that their hours of work should be reduced from ten to eight hours, the period now fixed by Government regulation as a day's labour on all public works. The contractors refused to reduce the hours of labour without making a corresponding reduction in the rate of wages, and the men accordingly struck. As the regulation in question was made subsequently to the commencement of this work, the contractors asked to be relieved from their obligations; but this the Government refused to do, alleging that if the contractors chose to employ men by the hour instead of by the day they could obtain labour at practically the same rates as formerly. The Legislative Assembly was appealed to, but a majority decided in favour of the Government, who will enforce the contract.

The construction of the North-Eastern Railway is going on satisfactorily, and a large number of men are now employed on the works. The ceremony of turning the first sod was performed by the Commissioner of Railways on the 20th June, and since then the contractors have been busily engaged in pushing on the works. The necessary offices for the staff of the contractors are built at the Melbourne end of the first section, which is light work, and will be completed, according to the present anticipations of the contractors, in about five months.

The Roman Catholics resident in West Melbourne have a church dedicated to St. Augustine in progress. The foundation-stone was laid in December last. The design is by Mr. T. A. Kelly, of Elizabeth-street, architect. It is in the Decorated style. The extreme length of the church is 85 ft., and width 45 ft.; the nave, 68 ft. long by 20 ft. wide, terminates in a polygonal apse 18 ft. wide; the aisles are each 12 ft. 6 in. wide, and the same length as the nave; porches and a vestry are added at the southern or chancel end; an organ gallery occupies the northern end of the nave. The principal feature in the façade is the tower, surmounted by an octagonal spire, terminating with a wrought-iron cross, at a total elevation of 100 ft. The spire is ornamented with gables and open pierced bands. A large and ornamental five-light window occupies the north gable, while the aisles are lighted by two-light traceried windows. The principal entrance will be under the tower, and consist of a deeply-recessed doorway, having banded shafts in the jambs. Internally, the church is divided into three naves by cast-iron columns, having the spandrels of the circles filled in with enriched and foliated open metal-work. The total height to ridge of roof from floor-line is 28 ft. The materials employed in the construction are bluestone, Geelong free-stone, and pressed cement. The accommodation afforded will be about 600 sittings, and the total expenditure 2,500*l.* The execution of the works has been undertaken by Messrs. Reid & Stewart, of North Melbourne.

The Presbyterian Church at Koroit is in the Early English style of Gothic architecture, from the design of Messrs. Reed & Barnes, architects. It is cruciform in plan, the nave being 70 ft. long and 35 ft. wide. The transepts have a depth of 12 ft. 6 in. by 21 ft. wide; the height from floor to ceiling is 36 ft., and to top of ridge 48 ft. A tower, with porch, flanks the front gable, forming the front entrance to the church, the tower and spire being 115 ft. high. The place which, in Anglican churches, is appropriated to the chancel, is, in this case, occupied by the vestry, 21 ft. by 15 ft., at each side of which, in the angles, are two entrance-porches leading to the church and vestry. The walls are to be built of bluestone, with brick and cement dressings, the roof covered with slates. A large three-light window occupies the front gable, and two-light windows are placed in the minor gables of the transepts; the side windows are two-light, each of the windows being spanned by a single arch. The internal walls are to be plastered, the ceilings diagonally boarded, which, as well as the timbers of the roof, are to be stained and varnished. The church will seat 400 persons, and is estimated to cost 3,000*l.*

Much light, of rather a sinister sort, has been thrown on the great Melbourne telescope. By comparing Mr. Severn's criticisms on it with the report of the board of visitors and the annual report of the Government astronomer, a mystery which previously surrounded the instrument has been dispelled. There is a general agreement between all the witnesses as to the instrument's badness of definition. When at its best it makes a star look like the ace of clubs. If an attempt be made to remedy this defect by altering the focus, a more circular figure is obtained, but it has a dark centre. It represents the stars to be illuminated cart-wheels. The counsel for the defence say that the telescope is not intended for star-work. It is a space-penetrator for revealing faint nebulæ. But the instrument that distorts one object will distort another.

Dunedin (New Zealand).—The new Athenæum and Mechanics' Institute, Dunedin, is situate on the south-east side of the Octagon, next but one to the South Australian Hotel, and comprises a shop-frontage and a large hall and other premises at the back. There is a steep fall from the Octagon backwards, and this is made available for kitchens, cellars, &c., as required. The front consists of two shops, with an 8-ft. corridor between them. One of these is 18 ft. by 30 ft., and the other 15 ft. by 30 ft., and each has cellars and kitchens, and large living-rooms above them. At the end of the corridor there is an entrance-hall, 12 ft. by 23 ft. 6 in., leading to the reading-room, which has an area of 36 ft. by 35 ft., and to the library of 34 ft. by 18 ft.; also to a magazine-room of 14 ft. Mr. David Ross is the architect.

BARNES'S HOME AND INDUSTRIAL SCHOOL, ARDWICK, MANCHESTER.

THE results of the Manchester Certified Industrial Schools, at Ardwick, have been gratifying, and from time to time enlargements of the building have been effected, until the present accommodation, for upwards of 200 children, occupies all available space, and renders further extensions impracticable. Aware of the inadequacy of the existing accommodation, the committee proposed to erect an additional school, capable of accommodating 200 children, in the neighbourhood of Manchester, but in an agricultural district, where a quantity of land adjacent could be had for garden and farming purposes, and adapted to the employment of spade husbandry; so that, in addition to the usual in-door industrial occupations, the boys may be fitted for out-door and agricultural pursuits. They were about to make a vigorous effort to collect the required sum, when Mr. Robert Barnes, an old friend of the Institution, called upon the governor, and having examined the plan which had been prepared, generously offered to pay the whole cost of building and furnishing, and to purchase a few acres of land, and has since carried out his purpose by paying over to the chairman and the governor the sum of 12,000*l.*

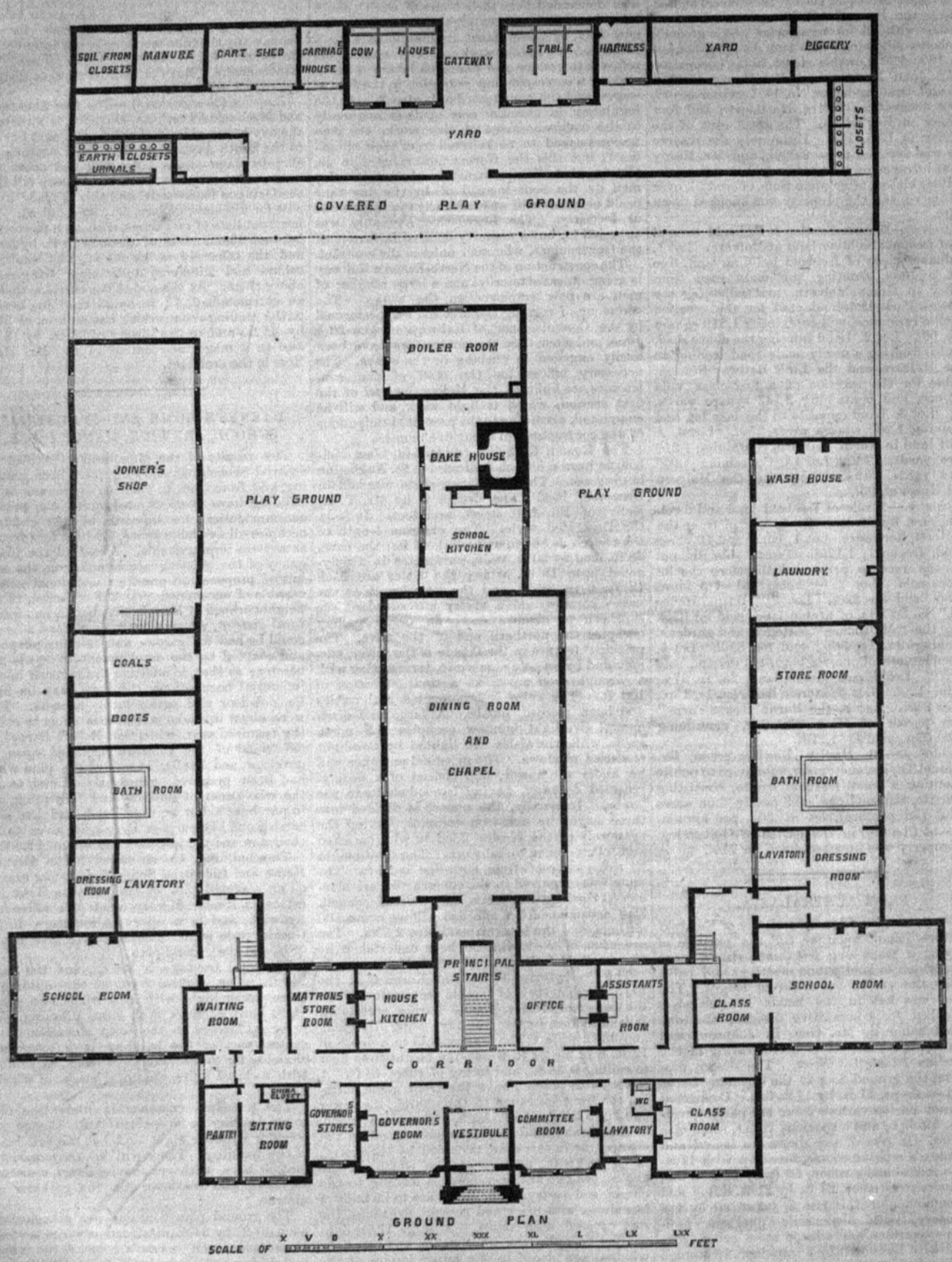
The building, to be called "The Barnes's Home and Industrial School," is being erected on an elevated plot of land on the Bank Hall estate, at Heaton Mersey, about five miles from Ardwick, and is a spacious structure in the Gothic style of architecture. We give a view of it, and the ground plan.

The total frontage is 196 ft., and the depth 242 ft. The central part of the building is three stories high, with side wings two stories high, built of brick with stone dressing. The principal feature in the front elevation of the central part of the building is a tower with chamber for the reception of a clock, surmounted with a slated spire, the total height of which is 111 ft.

The principal entrance is under the clock tower leading to a spacious hall, thence to a corridor running right and left the full length of the building. There will be accommodation for 200 boys, with resident masters, assistants, servants, and residence for the governor and matron.

The ground plan contains two school-rooms, each 40 ft. by 24 ft., designed as wings, series of class-rooms, and master's rooms; the chapel and dining-hall, 60 ft. by 35 ft., and 23 ft. high, at the end of which are the school-kitchen, cooking apparatus, bakehouse, and boiler-house, situated in the centre of the play-ground, leaving a space between the right and left wing for the recreation of the children. In the front are the governor's residence, committee-room, assistants' rooms, and offices, and in the side wings are store-rooms, bath-rooms, laundries, lavatories, drying stove, and workshops two stories high.

The principal staircase is approached from the central part of the hall from an arcade of red Runcorn stone columns, carved Bath capitals on moulded Yorkshire stone base. Over the arcade, niches are formed for the reception of busts. There is a central flight from the hall, returning right and left to the first floor, lighted by a large window. The staircases for the boys are at each end of the side wings. There is a side-



BARNES'S HOME AND INDUSTRIAL SCHOOL.

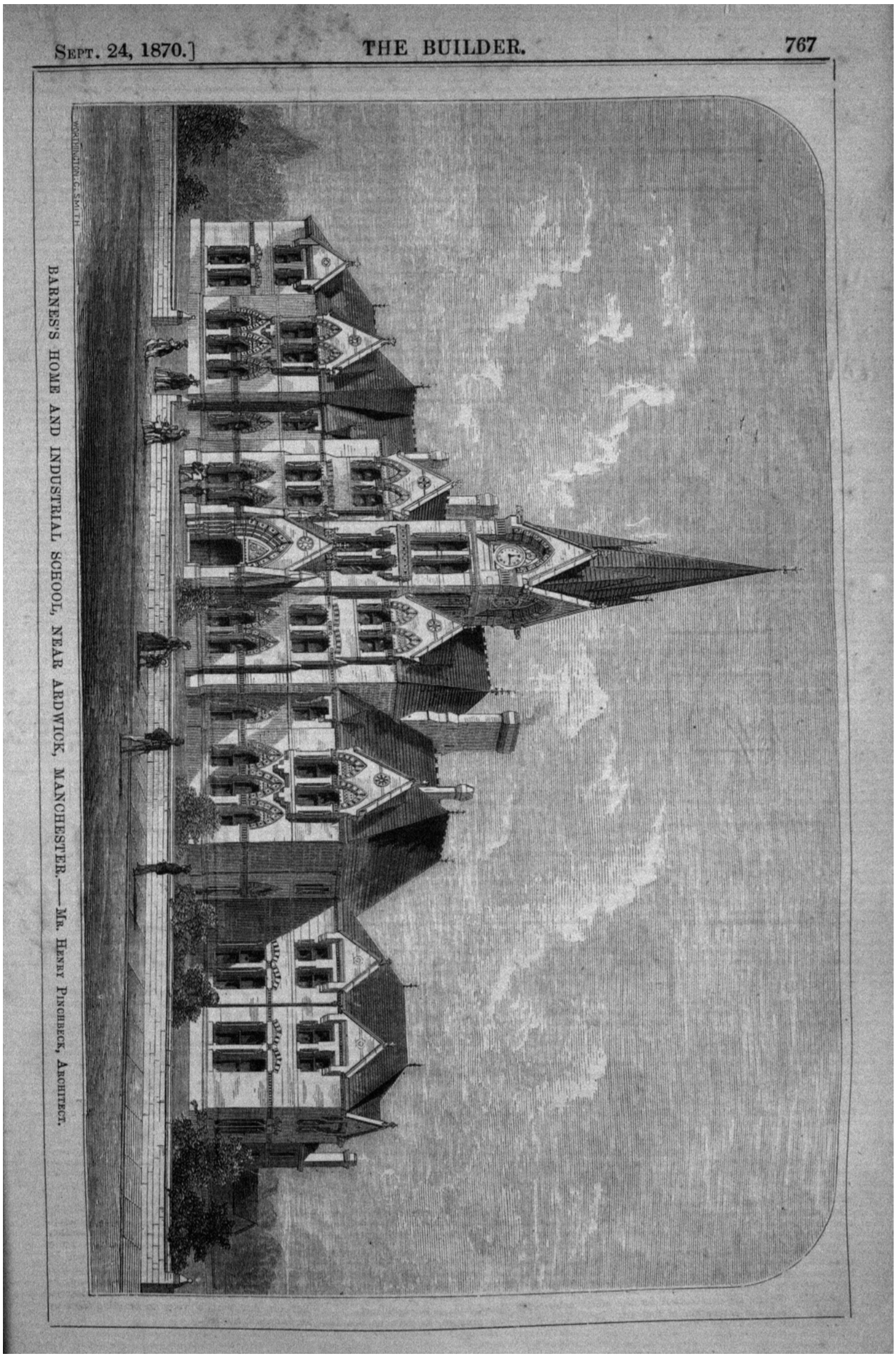
Plan of Ground Floor.

entrance for tradesmen at one end of the corridor, and a waiting-room for their accommodation, and for the children's friends who may from time to time visit them.

The first-floor contains governor's, matron's, master's, assistants', and servants' bedrooms, bath-room and dormitories for the boys. The sick-ward is on the second-floor, isolated as much as possible. Shafts are constructed for the admission of fresh and extraction of foul air. In the basement story are the storage and keeping cellars. The building is heated by means of steam-pipes. At the back of the school premises are the farm buildings.

The total cost of the erections, with the fittings and the site, will be about 12,000*l*. The contractors are Messrs. Thomas Clay & Sons, of Manchester and Audenshaw; and Mr. Henry Pinchbeck, of Manchester, is the architect.

The committee propose, as soon as possible after the Barnes's Home is opened, to supplement the grant of 3,000*l*. by the City Council, with a sum of money to be raised by voluntary effort, for the purpose of establishing a Third Branch in the City, the object of which will be to provide food and free education for some 150 children; also a dormitory for girls who may be committed under the provisions of the Industrial Schools Act, with a view to training them up for domestic service.



BARNES'S HOME AND INDUSTRIAL SCHOOL, NEAR ARDWICK, MANCHESTER.—MR. HENRY PINCHBECK, ARCHITECT.

THE BRITISH ASSOCIATION.

AT the fortieth annual meeting of the British Association for the Advancement of Science, held at Liverpool, Professor Huxley, the president, delivered an address chiefly on the moot question whether living matter always arises by the agency of pre-existing living matter or by *biogenesis*, as he called this view; or the contrary, which he named *abiogenesis*. He entered closely and fully into the evidence *pro* and *con.*, and then said,—

"To sum up the effect of this long chain of evidence:—It is demonstrable that a fluid eminently fit for the development of the lowest forms of life, but which contains neither germs nor any protein compound, gives rise to living things in great abundance if it is exposed to ordinary air; while no such development takes place if the air with which it is in contact is mechanically freed from the solid particles which ordinarily float in it, and which may be made visible by appropriate means.

It is demonstrable that the great majority of these particles are destructible by heat, and that some of them are germs or living particles capable of giving rise to the same forms of life as those which appear when the fluid is exposed to unpurified air.

It is demonstrable that inoculation of the experimental fluid with a drop of liquid known to contain living particles gives rise to the same phenomena as exposure to unpurified air.

And it is further certain that these living particles are so minute that the assumption of their suspension in ordinary air presents not the slightest difficulty. On the contrary, considering the lightness and the wide diffusion of the organisms which produce them, it is impossible to conceive that they should not be suspended in the atmosphere in myriads.

Thus the evidence, direct and indirect, in favour of *biogenesis*, for all known forms of life must, I think, be admitted to be of great weight.

On the other side, the sole assertions worthy of attention are, that hermetically sealed fluids, which have been exposed to great and long-continued heat, have sometimes exhibited living forms of low organisation when they have been opened.

The first reply that suggests itself is the probability that there must be some error about these experiments, because they are performed on an enormous scale every day, with quite contrary results. Meat, fruit, vegetables, the very materials of the most fermentable and putrescible infusions, are preserved to the extent, I suppose I may say, of thousands of tons every year, by a method which is a mere application of Spallanzani's experiment. The matters to be preserved are well boiled in a tin case provided with a small hole, and this hole is soldered up when all the air in the case has been replaced by steam. By this method they may be kept for years without putrefying, fermenting, or getting mouldy. Now, this is not because oxygen is excluded, inasmuch as it is now proved that free oxygen is not necessary for either fermentation or putrefaction. It is not because the tins are exhausted of air, for *vibriones* and *bacteria* live, as Pasteur has shown, without air or free oxygen. It is not because the boiled meats or vegetables are not putrescible or fermentable, as those who have had the misfortune to be in a ship supplied with unskilfully closed tins well know. What is it, therefore, but the exclusion of germs? I think that abiogenists are bound to answer this question before they ask us to consider new experiments of precisely the same order.

And, in the next place, if the results of the experiments I refer to are really trustworthy, it by no means follows that abiogenesis has taken place. The resistance of living matter to heat is known to vary within considerable limits, and to depend, to some extent, upon the chemical and physical qualities of the surrounding medium. But if, in the present state of science, the alternative is offered us, either germs can stand a greater heat than has been supposed, or the molecules of dead matter, for no valid or intelligible reason that is assigned, are able to re-arrange themselves into living bodies, exactly such as can be demonstrated to be frequently produced in another way, I cannot understand how choice can be, even for a moment, doubtful.

But, though I cannot express this conviction of mine too strongly, I must carefully guard myself against the supposition that I intend to suggest that no such thing as abiogenesis ever has taken place in the past, or ever will take place in the future. With organic chemistry, molecular physics, and physiology yet in their infancy, and every day making prodigious strides I think it would be the height of presumption for any man to say that the conditions under which matter assumes the properties we call 'vital' may not some day be artificially brought together. All I feel justified in affirming is, that I see no reason for believing that the feat has been performed yet."

On the influence of minute organisms in the production of diseases, both in insects and in animals, the Professor said,—

"There can be no reason for doubting that among insects contagious and infectious diseases of great malignity are caused by minute organisms, which are produced from pre-existing germs, or by homogenesis; and there is no reason that I know of for believing that what happens in insects may not take place in the highest animals. Indeed, there is already strong evidence that some diseases of an extremely malignant and fatal character to which man is subject are the work of minute organisms. I refer for this evidence to the very striking facts adduced by Professor Lister in his various well-known publications on the antiseptic method of treatment. It seems to me impossible to rise from the perusal of those publications without a strong conviction that the lamentable mortality which so frequently dogs the footsteps of the most skilful operator, and those deadly consequences of wounds and injuries which seem to haunt the very walls of great hospitals, and are even now destroying more men than die of bullet or bayonet, are due to the importation of minute organisms into wounds, and their increase and multiplication; and that the surgeon who saves most lives will be he who best works out the practical consequences of the hypothesis of Redi (that of biogenesis).

And as to the equivalent of Redi's thought in life, how can we over-estimate the value of that knowledge of the nature of epidemic and epizootic diseases, and consequently of the means of checking or eradicating them, the dawn of which has assuredly commenced?

Looking back no further than ten years, it is possible to select three (1863, 1864, and 1869), in which the total number of deaths from scarlet fever alone amounted to 90,000. That is the return of killed, the maimed and disabled being left out of sight. Why, it is to be hoped that the list of killed in the present bloodiest of all wars will not amount to more than this. But the facts which I have placed before you must leave the least sanguine without a doubt that the nature and the causes of this scourge will one day be as well understood as those of the pébrine are now, and that the long-suffered massacre of our innocents will come to an end.

And thus mankind will have one more admonition, that 'the people perish for lack of knowledge;' and that the alleviation of the miseries and the promotion of the welfare of men must be sought, by those who will not lose their pains, in that diligent, patient, loving study of all the multitudinous aspects of nature, the results of which constitute exact knowledge, or science."

We cannot give any account of the successive proceedings of the Association, but we shall select for notice a few points more especially within our province.

In Section G (Mechanical Science), Mr. C. B. Vignoles, C.E., in the chair, the sewage question was treated of in presence of a numerous attendance of members of Local Boards of Health. In this section, Mr. J. Bailey Denton read a paper "On the Extent to which Existing Works and Practice militate against the Profitable Utilisation of Sewage." He pointed out that there were few instances in which irrigation and natural filtration had been associated; they were, however, sufficient to support the conclusion that no system of irrigation should be adopted in which filtration did not form a part of it. Mr. J. N. Shoolbred followed with a paper "On the Sewage of Liverpool and the Neighbourhood." His conclusions were that the district of Liverpool and its neighbourhood is favoured by nature with above the average amount of facilities—first, for the collection of its sewage by water carriage, and then in finding, at a comparatively short distance, an outlet in the river Mersey for the larger portion, which it deems advisable to get rid of in this manner. It was again fortunate in having an outlet which, at present at least, secures immunity to the town from the unpleasant consequences which sometimes arise from creating an acknowledged sewage nuisance. Should the town itself at any time prefer to derive some benefit out of this refuse which it now throws away, or should changes in the law, said to be shortly contemplated in regard to the disposal of town sewage, compel it to seek another method of disposing of this refuse, it might be seen that nature provided for this new want, and that the town of Liverpool possesses, at no excessive distance, a most suitable and extensive site for utilising its sewage by irrigation upon the land, with, at the same time, a certain market in itself for the vegetable produce of that irrigation. Mr. W. Hope, V.C. (of the Sewage Farm at Barking), remarked that the sewage committee of this section were of opinion that there should be an Act of Parliament to prohibit the construction of sewers which were not made of impervious materials. Professor Reynolds showed that, as at Bedford, sewage could be applied to land without being a nuisance to the neighbourhood, provided that it was put upon the land before it had been many hours in the drains. Mr. Brierly, of Blackburn, expressed a confident opinion that sewage irrigation, under proper management, could be carried out successfully without the slightest nuisance, as at Carlisle, even in the immediate contiguity of dwellings. Professor Ansted condemned the sewerage works at Aldershott as a nuisance beyond all question. Mr. Rawlinson regretted to have to give a flat contradiction to a man so eminent as Professor Ansted; but the Professor had been telling this meeting what he defied him to substantiate, and had made a very gross mistake. The question of sewage irrigation would not be made better or worse by false advocacy. With regard to the irrigation carried on at Aldershott, if ever there was a success, or if we might ever hope to have a success in utilising sewage, without committing offence, —and he said it looking Professor Ansted straight in the face,—they must take Aldershott. Let Professor Ansted investigate it as he had done, and ascertain the facts. It had been his duty, on behalf of the Government, to investigate a complaint that the sewage farm at Aldershott was causing a nuisance. His report had appeared in print. A portion of the sewage of Aldershott was devoted to the irrigation of land as bad as the world could produce,—as the Lincolnshire farmers said of the fens, "worth nowt an acre,"—and now that land let at 25*l.* an acre per annum. There was no nuisance, and there was a living vegetation. If fresh sewage were put into carriers having a putrid deposit, then there was fermentation and offensive effluvium. The gentlemen who discouraged sewage irrigation had not carried their investigations far enough. Professor Ansted read a note, which he had made at Aldershott, to prove his assertion. Mr. Hawksley replied at great length to Mr. Rawlinson, and asserted that Professor Ansted's assertion was "true in every word." At Aldershott the stench was abominable, and the land and vegetation were killed by over-saturation. The land had been let at 25*l.* a year; now the tenant paid no rent, and received a subsidy of several hundreds a year to occupy it for Government purposes. He deprecated "blue-bookism," and advocated the chemico-mechanical system for the disposal of sewage as the best. Mr. Glazebrooke warmly advocated the sewage irrigation system; and the discussion was sustained by Professor Williamson, Mr. J. Wyatt (Bedford), and Mr. Grantham.

In the same section (G), Colonel Sabine, C.E., read a paper "On Pneumatic Transmission through Tunnels and Pipes." He said that for the purposes of transmitting light parcels by means of pneumatic tunnels, he would employ hydrogen gas in the proportion of 1 to 2½ of atmospheric air, than which it was a better agent, and the plan would be economical by reducing the size of the large tubes required when common air was employed. Small pneumatic tubes might be worked more profitably than large ones, and the working of small tubes for transmitting letters between the several post-offices in London and other large cities had already proved their economic practicability. As to applying the principle to railway traffic, passenger and goods, he did not believe that a pneumatic line working through a long tunnel could ever be applied so economically as to be equivalent to steam power. Captain Rowett read a paper "On Ocean Telegraphy." He advocated the general adoption of hempen instead of wire cables for ocean telegraphs. He concluded by stating his belief that the cost of laying a hemp cable across the Atlantic would be less than half that of the present cable, and that messages could be then sent at a considerable reduction from the present tariff.

In other sections of the Association meeting, Mr. F. B. Grisson, F.A.S.L., read a paper entitled, "Anthropological Note on Carved Stones" recently discovered in Nithsdale, Scotland; and General Sir H. C. Rawlinson, K.C.B., read one "On the Site of Paradise," taking as his data the cuneiform tablets found among the ruins of Nineveh, and executed in the seventh century B.C.; those tablets being, even at that early time, copied from still earlier tablets. The conclusion arrived at was that the site of the Garden of Eden was in reality the land of Babylonia.

The Chemical Section, during the meeting, formed themselves into an excursion party, which visited the works of the Union Plate-glass Company at St. Helen's, where the various operations were explained and illustrated. The melting by means of Siemen's regenerating furnace, the casting, annealing, grinding, and polishing, excited much interest among the excursionists. A very curious influence exerted by heat upon diamonds was brought to their attention. When a diamond is used to cut hot glass it will only last for one day, and it assumes a milky appearance. Diamonds in constant use for cutting cold glass last about three months. Each diamond costs from 35*s.* to 45*s.*, and is about three times the size of an ordinary glazier's diamond. Hot glass is cut more readily than cold glass.

At the general meeting of the Association it was resolved to hold the next annual meeting at Edinburgh, a little earlier in the season; and the next following at Brighton.

Trade Outrage.—A supposed trade-union outrage was committed at Orgreave, near Rotherham, between Saturday evening and Sunday morning. The brickyard belonging to the Fence Colliery Company was entered during the night, and 24,000 bricks destroyed by being trampled upon. Dervick, the man who contracted to make the bricks, keeps aloof from the union, but says he has received no complaints from the members. The police have examined the premises, and discovered traces indicating that three men must have been concerned in the outrage. A clue has been found to the supposed offenders.

ODD NOTES ON SASHES AND SASH-HANGINGS.

SIR, — The experience of a carpenter's "mouse" on sashes and their fastenings may awaken some recollections and elicit some kind and useful words in the columns of the *Builder*.

I need hardly explain my name or situation. A "mouse" in technical language of the builder's workshop means a small cylindrical slip of lead, to which is attached a cord or string, and it is sent as an *avant courrier* through the pulley-box, with the end of the sash-line.

You see, sir, my occupation is a useful and indispensable one, and it is often a most irksome and disagreeable one besides. In my agony, I can only compare my position to that of a little apprentice sweep, who is forced by a heartless master to ascend or descend narrow chimney-shafts and corrugated openings, where there is no proper passage, the consequence being, like mine, that the poor little fellow sticks in the chimney, and cannot be burned out, as is often wished. I have, since my earliest days, been connected with sash-making and sash-breaking, and I ought to know something about hanging sashes,—be hanged to them! Pulley-boxes I detest; they have always been a mousetrap to me; many of my kindred have been immolated, crushed on the axes, and broken on the wheel,—sometimes severed in twain, and their shattered remains buried in an accumulated *débris* of brick, plaster, and chips behind the boxings. My first messages or errands in early life were performed in the interest of the lead weights family. A sympathetic feeling existed between us, for we were born of the same material. As years advanced, *Lead*, which took the lead, was discarded, and the case-hardened ironmonger sent iron in his place. I must not trouble you too much, however, about my own sorrows. As an experienced "mouse," I protest against my longer employment. This may seem paradoxical or suicidal; be it so. If sashes are to be hung, let them be suspended without rope or chain, and if there is no one clever enough, or willing to do it, let us be spared in the mean time the frightful exhibition of the stretched rope. I know a secret about hanging sashes; I received it on the death-bed of a brother "mouse;" it is known to only a very few. I will, Mr. *Builder*, reveal it to you, because I know you have our interest at heart. I would have revealed it long ago to the world, only I feared its adoption would still perpetuate the rope system. It has, however, an advantage over the present one in use, neither the rope nor the pulley-boxes are seen. The secret lies in a nutshell. The pulley-boxes are sunk in the sash frame, opposite the meeting-rails of each sash; so, when the sashes are acting in their places, the sill of the bottom sash never rises above the centre of the frame, where the pulleys are sunk, nor does the top rail, when the top sash is lowered, come below the centre; thus are the frightful ropes and pulley-boxes hidden.

A "mouse" has seen this plan in operation: all that is needed is proper fitting to hang the two sashes from their centres, also proper provision, behind and below the frame, for the passage of the weights; they will, in this case, go down a great deal further than in the old plan. I do not want to see it perpetuated, but if there be some folk who desire to hide both rope and pulley-box out of sight, here is a plan for them with "a mouse's compliments." I have seen during my experience sashes hung in a variety of ways, and as no one feels where the shoe pinches but the one who wears it, I know a little of the pain and trouble belonging to each. When a young "mouse" in my teens, I have helped to hang sashes with weights and sheaves, acting somewhat similar to the weights of an eight-day clock. Two weights were sufficient to hang both pairs of sashes: the principle of action was that when you pulled one sash down the other was necessitated to rise the same distance. I have helped to hang sashes where the pulley boxes were sunk in the head of the sash-frame, and I have helped to hang them with chains. I have seen sashes hung with cords without weights, the weight of one sash being made to hang the other. This was done by connecting the sash-line of both sashes, passing through a pulley-box, or over an axle, constructed for the purpose; the pulley or axle being stationed centrally at the top of the stile, near the head of the sash. When one sash was raised, the other lowered accordingly. An improvement on this expedient might be made by sinking the pulley or axle in the head of the sash-frame, instead of the stile. Two small brass pulleys might be made, to sink flush with the stuff, to avoid weakening the strength of the wood, by using a large box and axle. Another advantage (if the method possesses any) is, that an unsightly fixture is removed from the face of the stile, where it is in the way, to the head where the simpler contrivance can be adjusted, and sunk out of the way. Here is another method: let the spiral springs, with a cork core, be sunk in a centre-bit hole, a distance from either end, on the hanging side of the sash. Let them show, at least on each side, a ½-in. projection, before they are forced back by the necessary pressure needed, in pushing the sash into its place. The reactive pressure of the compressed springs will be more than sufficient to hold the sashes for a long time in their place, and allow them to work up and down. This idea may be improved upon, in a variety of ways, to suit large or small sashes, common-place work, and respectable and highly-finished work. The amount of friction must be studied in each case, and how to overcome it, when too great, and how to lessen the defects arising from its application. The skilful workman needs no instruction from a "mouse" on that subject.

I have, of late years, looked with much pleasure on the several attempts made to hang sashes, without enlisting the service of a "mouse," to perform the ignominious duties of a "Calcraft." I have seen sashes hung without sash-line, with springs, with a facing of leather, with corks, with chains, with cogged-wheels, and with a varity of tongue-shaped springs and nondescript contrivances, fastened in laterally and siderally; I must, however, in candour confess, that none of these methods, though many of them possessed peculiar advantages, were anything like satisfactory, and that, with all its obvious defects, the old system as yet is the best, and perhaps the simplest.

A spring requires a hard, unbending, and somewhat smooth and even substance to press against, not the wood itself, but an insertion of a brass or iron slip, to act up and down upon, and against. It requires also that the sashes be closely fitted, with little freedom, and perfectly square, but this is not always to be had, though indispensable. Though the same exactness should be observed with line-hung sashes, the principle of suspension by weight makes a difference. The weights acting on the pulley lessen the power or lift required to raise the sash, a very slight effort only being required in well-balanced sashes.

When springs are used, and when the sashes are heavy, the force required is more than what ladies' fingers would like to exercise. As a "knowing mouse," I would advise all workmen to fasten the sash-line two-thirds the way up from the bottom, or hanging position of each sash. In old sashes, that require re-hanging, it is necessary to fix on the line near the top, as the freedom is so great from "wear and tear." By doing this the sash rises more evenly, and is not liable to get anglewise and "stick."

I am almost tempted here to say something about sash-fasteners and window-blind appliances, but before venturing on such a perilous enterprise, I must secure your protection, as well as the law. If I did not, I fear the Brummagem hardware man and his patronisers, the "Jerries," would waylay and slay me for "spoiling trade:" that's the word, Mr. *Builder*. Some day, however, I will open people's eyes about builders' ironmongery, tons of which are "made to sell," like the houses it is used in. Oh! if but this captive "mouse" could speak, he could unfold a tale that would cause an earthquake in Brummagem, and would cause the "Jerries" to expire in the greatest agony. I was treated, by an old master of mine, the other day, to a sight of the Workmen's Exhibition, and I was curious to see the different sash "shifts" and appliances there exhibited. I have not time now to describe them in detail; suffice it to say, not one of them can be called an improvement, though some of them are certainly innovations. I blushed for my country and my kindred, to see such folly and madness exhibited and called "improvements." I have no doubt some of the inventors expect gold medals, and will certainly vent their ire upon the "back-stair influences" that voted them only "Honorary Mention." They may feel lucky indeed, and highly honoured, if they even succeed in obtaining the latter. With one or two exceptions, I never witnessed such clumsy workmanship, and such a murdering of time and butchery of materials, as some of these sash-hanging improvements exhibit. I left the building disgusted, and I went home, thanking my good fortune that I was still

"AN EXPERIENCED MOUSE."

P.S.—I must add an authentic anecdote, by way of postscript. During my early days, one of the first practical lessons of usefulness, besides boiling the glue-pot, was to learn how to make a "mouse." The youngest apprentice was generally called upon to do it. A young country lad, I remember, on one occasion, was called on suddenly by his master to go to the office and bring a chisel with him, to cut a slip of lead to make a "mouse." The boy, not being a very bright specimen, and not thinking of the bore of a pulley-box, cut a large piece of lead, and procured a hammer as he was desired, to beat it round. He next tied on a piece of string as thick as a chalk-line, and, when he considered his work done, he brought it to his master, who was in waiting. "What the d—l, Jack," said he, eyeing the young hopeful, who had brought something like a mason's elongated "bob." "What on earth is this?" "It's — it's — a mouse, sir," stuttered the bewildered youth. "A mouse!—be hanged, you stupid urchin," replied his master; "why that's not a mouse, but a *rat*."

FORCE AND MOTION.

IN asking how can a finite force produce endless motion, Mr. Kepling seems to consider hypothetical cases, impossible in themselves, but, given by way of illustration, are statements of veritable possibilities.

We cannot conceive of a force of expulsion without the finite idea of a fulcrum, and the idea of a fulcrum involves the idea of a force existing which must stop the motion imparted. If a cannon-ball were not acted on by gravity, it and the cannon would be without weight, and there could then be no power of expulsion from the cannon.

To assume conditions, then, which will expel the ball is to assume conditions which will stop it. In these remarks I omit, it will be observed, any mention of the necessity of the resisting air to explode the powder,—a necessity, however, which the hypothesis involves.

Perhaps our nearest conception of a force given with the slightest of fulcrums is the force given by breathing. Thus we read, God "breathed into his nostrils the breath of life." Perhaps the truest conception is that the power which can keep ceaseless motion in an ever-rolling ball is, indeed, the Eternal Life.

HORACE FIELD.

SIR,—The opinion expressed by Mr. Kipling, that a finite force communicated to a projectile in a vacuum could not communicate an infinite motion, is doubtless correct; but it must be conceded that an infinite force communicated to a projectile in a vacuum would cause an infinite motion, and it were perhaps impossible to prove that a force communicated to a projectile could not, if that projectile could in its passage suddenly enter an endless vacuum, then become infinite.

Although it is our duty to make what discoveries we can, yet we shall always be right in deferring to the opinions of distinguished mathematicians until we can clearly prove them to be wrong.

The unequalled Sir Isaac Newton observed that the "*vis inertiæ* is a passive principle, by which bodies persist in their motion, or rest, and receive motion, in proportion to the force impressing it, and resist as much as they are resisted."

According to this last sentence, a body moving in a vacuum (which body would receive no resistance) could have to impart no resistance, and would therefore have to part with none of its force, and which would, therefore, continue undiminished to impart infinite motion to the projectile.

The term *vis motrix* has been used by the followers of Leibnitz, to denote a force inherent in a "body only while in motion, which actually carries it from place to place by acting upon it always with the same intensity in every physical part of the line which it describes."

It were perhaps possible to, in some degree at least, prove this by actual experiment. A ball projected in the atmosphere will be acted on by agents,—first, by the propelling force; secondly, by direct resistance of the atmosphere; thirdly, by its downward pressure or gravitation; fourthly, by gravity; possibly, fifthly, by centrifugal force; and sixthly, by slight magnetic or polar attraction, and possibly by solar and lunar attraction or repulsion, according to their places at the time; for if the moon will attract the water (and cause the tides) more than the earth, may she not attract the earth more or less than the iron or other metal that is in or upon its surface? and if such were the case, the relative specific gravities of metals and water would vary with the moon's phases.

If a chamber a mile long were made sufficiently high and perfectly vacuitous, then the second and third agents would not act on a ball passing down it; and the fifth, sixth, and lunar and solar influences need not be considered, as they would be small in any case.

If, through an air-tight hole in the end of the chamber, we were to fire a rifle-bullet with such a charge of powder as should cause it to strike the ground at the other end of the chamber, then gravitation would necessitate the ball's describing what would be (were radii to the earth's centre parallel, which we know they are not) a parabola, and the direction of the ball, when it should arrive at the parabola's vertex, would be the result of the final increment of retardation caused by gravity and its diminished velocity. Acceleration caused by gravity would now begin to unite its force with that of the velocity. Now, whether this will increase the actual rate of feet per second of the ball in the latter half of the parabola must depend on the angle of inclination at which the shot was fired: if at only 2 deg. or 3 deg., then the diminution of velocity through resistance would (if such, independent of gravity, could exist in a vacuum) be greater than the increase of force caused by acceleration; but, if the angle of inclination were, say 85 deg., then acceleration would cause a surprising increase of the rate and force of descent of the ball from the vertex of the parabola, at which point it would have lost nearly the whole of its velocity.

Adopting a small inclination to fire from, and using a necessarily greater charge of powder in consequence, then retardation and acceleration will cause but little alteration in the velocity, which must sensibly diminish under the hypothesis that force is alway finite. If, therefore, a plant were placed in the vacuitous chamber, and near the rifle, and of a thickness such that a bullet would only go through it; and if the same plank were placed at or near the end of the chamber at, perhaps, a mile distant, then, if the bullet would still, with the same charge of powder, go through it, then it would appear probable that force is infinite.

It were difficult to discover either the tendency or truth of the assertion made by "M. D. A.," that there can be no force without motion, as force is not necessarily at all times active; it may be passive, and unable, without an additional force, to cause motion. The lateral pressure of water in a reservoir, for instance; also when a horse-shoe magnet retains in suspension a piece of iron,—there will be the force of attraction, without motion perceptible to us.

HENRY AMBROSE.

THE AYLESBURY SURVEY.

SIR,—My attention has been drawn by a letter written by "C. E." in your last issue of the *Builder* to the above survey. I think my tender was the lowest, viz., 105*l*. I am of the same opinion as "C. E.," that to invite tenders for a survey, and to leave the competitors in ignorance as to their decision, and select one considerably in advance of mine, is indeed a most unfair and "dark" proceeding.

A SURVEYOR OF TWENTY YEARS' EXPERIENCE.

P.S.—If mine is the lowest tender, I believe I am entitled to the work by the wording of the advertisement, and from my conversation with Mr. Bailey Denton.

SIR,—I was one of the competitors for making the above survey, and, in common with others, was put to the trouble, loss of time, and expense of making two tenders, as the Local Board were not satisfied with their first advertisement. My tender amounted to 133*l*. 13s. It was only from the letter of your correspondent "C. E." in your last number, that I learned a tender had been accepted amounting to 187*l*. 10s., being 53*l*. 17s. more than my Tender. Now, as I sent in the names of fifty-nine parishes, &c, together with a list of some fifteen or twenty towns, amounting altogether to upwards of 320,000 acres, which had been surveyed and mapped by me, I have a right to ask on what ground my tender was rejected; and why one nearly half as much again as mine was selected; for without knowing at all who was appointed, and without any disrepect to that gentleman, I will venture to say his claim to that appointment could not have been superior to mine; and I consider a great wrong has been done me, and that the affair altogether was a "huge farce."

THOS. L. BATE.

SIR,—The letter of "C. E.," in your journal of the 17th inst., tends to explain something more than the want of courtesy due to gentlemen whose professional abilities have been called into requisition by the local Board of this town.

Having been invited by public advertisement to compete for this undertaking, and confined in the delivery of estimates to a period so circumscribed as to require extension, those who complied with the first publication claim some explanation of the merits upon which the Board made its selection, seeing that there were lower estimates than the one adopted.

Public competition is well enough, so long as the public reap the benefit, but impartiality should be the rule of the governing power. Presuming the absence of local ability, and the necessity of extraneous aid, the latter being sought, without reservation in the circular of instructions, on behalf of the Board, to repudiate the acceptance of the lowest or any tender, those who staked their chance upon an honourable decision expected fair play and an acknowledgment of the trouble to which they had been put.

The proximity of figures, between a number of estimates lower than the one accepted, was so close as to justify the adoption of the lowest.

The ratepayers will have the supreme satisfaction of knowing how studiously their local Board looks to economy in its expenditure, seeing that others would have required less for doing this work, and that it would have been executed with equal credit, accuracy, and despatch.

FAIR PLAY.

CONSUMPTION OF SMOKE.

AT Hammersmith, Mr. William Wigmore, a builder and contractor, of Waltham-green, appeared to answer an adjourned summons for using a furnace so constructed as not to consume the smoke. The defendant denied that he had a furnace within the meaning of the Act. He said it was only a small portable engine with a fire-box. According to his view, a furnace to be unlawful must be set in brickwork, and be of a permanent character. Mr. Ingham looked at a dictionary, which described a furnace as an enclosed fire-box. Mr. Sandison, the Government engineer, said there would not be any difficulty in constructing an engine of that kind so as to consume the smoke. He had seen several engines so constructed. This evidence was confirmed by another engineer, and they both stated that they saw black smoke issuing from the chimney that day. The defendant described the chimney as a small funnel, and called his engineer, who said no more smoke came from the engine than that which came from an ordinary chimney. Mr. Ingham, after hearing other witnesses, fined the defendant 5*l*., and 5*l*. 12s. 3d. costs. The defendant expressed an intention to appeal against the decision.

COMPENSATION CASES.

THE HOUSE OF DETENTION.—BENNETT *v.* THE JUSTICES OF MIDDLESEX.

THIS was a compensation case, tried in the Sheriff's Court (before Mr. Under-Sheriff Burchell and a special jury), for some premises in Woodbridge-street, Clerkenwell, required for the enlargement of the House of Detention. The claimant, as a gold-beater, sought compensation for his removal and establishment in other premises, which he had recently taken in Turnmill-street, and which would require an outlay. The claim made on the Justices was 3,056*l*., which was resisted as excessive.

Mr. Horace Lloyd, Q.C., and Mr. J. O. Griffits were for the claimant; Mr. Littler appeared for the Justices.

The case lasted till nearly five o'clock, and a good deal of evidence was given on both sides. There was a wide difference in the evidence of the surveyors. Mr. Farmer (Debenham, Tewson, & Farmer) was the principal witness, besides the claimant, in support of the amount mentioned; and on the other side Mr. F. J. Clark (Farebrother, Clark, & Co.) and Mr. Edwin Fox (Fox & Bousfield) were called. A claim was made for a reinstatement in the new premises, which were more extensive than the old place, and that claim had been only recently started. Mr. Clark mentioned, that as surveyor to the Justices of Middlesex, he had laid out some 40,000*l*. to enlarge the prisons, and this was the only case he had not settled. By the premises now immediately required, one side of Woodbridge-street would be taken, and the House of Detention would be isolated from houses.

Mr. Lloyd asked for full compensation for the loss Mr. Bennett would sustain. The claim for his interest, &c., was 1,617*l*., and for compensation about 1,400*l*. In the course of the case it was stated that the net profits were agreed upon as 865*l*. a year.

Mr. Littler ridiculed the claim made as preposterous, and denied that it was a case for a reinstatement of business, arguing that the new premises were not required, except for a larger business, which the ratepayers were not to be called upon to pay. It was an unfortunate circumstance that additional room was required for the criminal classes of the county, and all that could be expected to be given was a fair compensation.

The jury retired after the under-sheriff had summed up, and, after a consultation, assessed the interest in the premises at 950*l*., compensation at 650*l*., and fixtures 400*l*., making 2,000*l*.

Mr. Littler said an offer had been made to that amount.

Mr. Lloyd replied that the offer was without considering the interest of the under-tenants, whom the county would now have to satisfy.

THE BRITISH MUSEUM.

SIR,—Permit me respectfully to make two trifling suggestions to the authorities of the reading-room of the British Museum. The first is that, by way of ventilation, a little fresh air be now and then admitted into the corridor leading from the great hall into the reading-room. One of the skylights could easily be made moveable for the purpose, and the strong musty smell, at certain times sickening, would thus be got rid of. The other is to fix a few hat-pegs in the lavatory. Owing to the absence of these, the scarcity of soap (as a rule), and the dreadfully damp towels, a wash really becomes an unpleasant operation.

A little fresh air, too, would not hurt this place; in spite of the perfection of every apparatus there is always a close, unpleasant smell.

A. C. G.

HANDRAILING HANDS.

SIR,—I have just read (in last week's issue) your notice upon "Handrailing." I hope your numerous readers in the trade will rouse themselves and master the great difficulty, so that in a short time instead of only one man in a shop being considered competent to undertake the work of a staircase and handrail, it will be given out the same as any other job, each man taking his share, and so end a monopoly which is a disgrace to our times; affording, as it does, such facilities for the working man to obtain a perfect knowledge of geometry, and so dispense with that blind method of working, "the rule of thumb."

I have seen many instances of what you refer to respecting the intolerance of staircase hands a few years back, when to put the job into the hands of any but the "Sir Oracle" of the shop, the great practical geometrical professor, would have been thought as bad as if at the present time the decoration of St. Paul's were intrusted to an East-end theatrical scene-painter. I hope you will insert this, as it may tend to awaken the dormant faculties of some of my brother workmen.

F. D.

FALL OF HOUSES NEAR GLASGOW.

ON Tuesday forenoon the back front of two large four-storied houses in course of erection, and nearly ready for the roofs, at the corner of Belmont-crescent, west of the bridge at Kelvinside, suddenly burst outwards near the bottom, and fell, burying eleven of the workmen in the ruins. About fifty men employed in the neighbourhood immediately rushed to the spot, and began to remove the rubbish, and extricate the sufferers. In a short time five were taken out dreadfully crushed and quite dead; three seriously injured, were removed to the infirmary, and the rest were able to walk to their homes. If the walls that fell were of the faulty construction of those left standing, the cause of the catastrophe is clearly indicated. But this, no doubt, will be thoroughly investigated before the Fiscal. It is astonishing that the speculative building operations largely going on in this and other suburbs of Glasgow should be regulated by no Buildings Act, nor be under the official supervision of qualified surveyors. This accident, if accident it can be called, will show the necessity of speedy legislation in this respect. The sanitary arrangements are also very far from what they should be, and should receive immediate scientific attention.

MONUMENT IN MEMORY OF DEFOE.

A LOOK-BACK to earlier volumes of the *Builder* is satisfactory in this respect, amongst others, that we are reminded how many things have been done, how many alterations made, how many wants supplied, the necessity for which had been there pointed out. As to the want of a monument to Daniel Defoe, for example, and the general neglect of the graves of other eminent individuals in Bunhill-fields Cemetery, reference was made again and again in our pages, and years passed without attention. Ultimately, however, the want became apparent; the grounds have been put in order, after a fashion; some of the monuments repaired; and last week Mr. Chas. Reed, M.P., with appropriate speech, unveiled a monument that has been erected by subscriptions of "the boys and girls of England," and is inscribed:—

DANIEL DEFOE.
Born in 1661; died 1731.
Author of "Robinson Crusoe."

A second inscription glorifies a religious publication, in which the appeal to the boys and girls is said to have appeared, and ought to be cut out next week at farthest. The monument is of white marble, and consists of a small obelisk on a pedestal, a common affair, so far as design is concerned, without a morsel of art in it, but fairly executed, so far as regards workmanship, by Mr. Horner, of Bournemouth.

In respect of this want of art, the new monument agrees but too well with the rest of the memorials. What a dreary expanse of unmitigated ugliness this burial-ground presents! Not a spice of imagination or taste anywhere apparent, and yet how full of interesting associations it is. The coarse common sculpture in the monument to the immortal dreamer, Bunyan (restored in 1862), is fast decaying.

THE OSWESTRY AND ELLESMERE COTTAGE HOSPITAL.

THE formal opening of the Oswestry and Ellesmere Cottage Hospital took place lately. The new hospital, the foundation-stone of which was laid, with Masonic honours, on November 1, 1869, by Sir Watkin Williams Wynn, bart., M.P., has been erected at a cost of nearly 2,200*l*. Towards the building fund all classes and creeds, notably including working men, for whose special benefit the institution is intended, have contributed liberally.

The style of the building is Cottage Gothic, and it is faced with Fenn's Bank bricks, from the yard of Mr. Savin. The sills and heads and stone dressings are of Cefn stone, from the quarries of Messrs. Dennis & Co. The string-course is terra-cotta, manufactured at Ruabon by Mr. J. C. Edwards. The three gables have ornamental Gothic barge-boards. The entrance is formed by stone columns, with carved capitals, and an arch with carved spandrels, on which is inscribed on a ribbon intertwined in the carving, "I was sick and ye visited me," the work of Mr. G. Landucci, of Shrewsbury. Over the entrance is a balcony for the convalescent patients to sit in and enjoy the fresh air.

On the ground-floor is a large dining-room, 21 ft. by 13 ft. 6 in.; surgical store-room, 10 ft. 6 in. by 10 ft.; matron's sitting-room, 16 ft. by 13 ft.; larder, 10 ft. 6 in. by 9 ft.; kitchen, 18 ft. by 13 ft.; scullery, 12 ft. 6 in. by 13 ft.; washhouse, 14 ft. by 13 ft.; laundry, coal and wood sheds, bath-room, large ward for four beds, 21 ft. by 20 ft.; small ward for two beds, 18 ft. by 12 ft.; and a nurse's kitchen with a window looking into each ward. The hall, 16 ft. 3 in. by 14 ft. 3 in., and a side corridor, 15 ft. by 5 ft., are laid with a tesselated pavement supplied by Messrs. Boote, of Burslem, the colours employed being blue, black, buff, red, and white. The outhouses are fitted with every convenience, the washhouse containing two boilers, and non-absorbent troughs by Mr. J. C. Edwards, of Trevor, and the laundry a stove capable of heat.

ing twenty-four irons. The kitchen is fitted up with Flavell's cooking range, supplied by Mr. E. Shaw, of Oswestry, to whom was also entrusted the bell-hanging arrangement. Slate shelves and zinc ventilators ensure the coolness of the larder.

On the first floor are two wards and nurse's kitchen, corresponding with those on the ground floor; also a sitting-room for the nurses when off duty, a general store-room, matron's store-room, a linen store, and two bedrooms. On the upper floor are four bedrooms, one having Rufford's bath, with shower-bath fitted up in it for the use of the nurses. The walls of all the wards are cemented with Parian cement, and lined 3 ft. 6 in. high, with turquoise and white tiles, supplied by Messrs. Minton, Hollins, & Co. The thorough ventilation of the wards is secured by windows on opposite sides, the upper parts of which are hinged on the bottom to fall inwards, forming a hopper, the top of the hopper being covered with perforated zinc to prevent any draught and to exclude insects. There is also one of Arnott's ventilators in each ward, and a bell to summon the nurses in cases of emergency.

The building has been erected by Messrs. W. Trow & Sons, from the designs, and under the superintendence of Mr. W. H. Spaull, architect, of Oswestry, the whole of the building arrangements having been conducted by Mr. Richard Westwood, as foreman.

The grounds surrounding the hospital have been laid out by Mr. Porter, nurseryman.

MOVE THEM BODILY.

THE great improvement of widening Shepherdess-row, at the City-road end, will shortly be completed, according to all appearance. It now forms a good wide street, with the exception of the part where the one-storied almshouses unpleasantly project too forward, whereby the pathway lessens the width of road in front some 6 ft. or 8 ft. Cannot the almshouses be bodily shifted back by means of excavating under the separate walls, and placing balks of timber under them upon rollers, each wall, when the building is moved far enough back, being under-pinned previously to removing the timbers? Such a process has been carried out before now in America, and with larger structures. S. Y.

CONINGSBY'S HOSPITAL, HEREFORD.

SIR,—Not having perused any other report of the recent meeting of the Archæological Association at Hereford but your own, I am unable to tell from whence you have derived the extraordinary description (given in your page 737) of "the coat of arms of the Coningsbys," placed over the entrance of Coningsby's Hospital, in that city. It is pronounced to be remarkable, as an example of "what is known as canting or punning heraldry;" and as representing "on the one side the lattice-fence, which kept the conies in their abode, and on the other side the conies enjoying themselves within it, according to their fashion."* Were this actually a true description, it would be a remarkable example indeed, but more like an *impresa* or allegorical device than a coat of arms.

The shield, in fact, represents the arms of Sir Thomas Coningsby, the founder of the hospital, and those of his wife, Philippa Fitz-Williams impaled. The conies are not "within" any "lattice-fence;" and what has been mistaken for lattice-fence is the well-known lozengy coat of Fitz-Williams. In the hall at Hampton Court, the seat of the family in Herefordshire, "Conisbie bears Gules, 3 conies *sciant*, within a border ingr. argt. impaling Fitz-Williams;" in the hospital, on a quarry of glass, was "Conisbie not bordered," also impaling Fitz-Williams, with the date 1614. (Dingley's "History from Marble," pp. ccxxiii. and ccxxviii.) It will be observed that the name was usually pronounced and written Conisbie: therefore the assumption of conies as the charge of the family arms was a very natural one. They do not, however, occur in any early roll, nor was the family of importance till the reign of Henry VIII.

JOHN GOUGH NICHOLS.

*** The observations of our esteemed correspondent do not, after all, disprove the remark that the arms are noticeable as an example of canting or punning heraldry.

* It was the account given by Mr. Edmonds, who was the guide on the occasion.

CHURCH-BUILDING NEWS.

Bampton. — The parish church restorations have been completed, from plans prepared by Mr. E. Christian, of London, and the contractor for the larger portion, viz., the nave and aisles, was Mr. Bartlett, of Witney. Mr. Wakeford was clerk of the works during the execution of the restoration of the transepts, nave, &c. The pulpit, which is of Caen stone, has been elaborately carved by Mr. B. de Sziemanowicz, of Westminster. It stands upon a stone base, and includes in the whole ten caps, four red and six green Irish marble columns, five panels of alabaster marble, besides all carvings necessary to show the work to the best advantage.

Leycett (Newcastle-under-Lyne).—A Mission Church has been opened at Leycett, and another will be opened in a few months at Onneley, on the Shropshire side of Madeley parish. The church and school building at Leycett is for the increasing population (principally colliers and their families) living near it. St. Saviour's Mission Church (as it is dedicated) is in the Gothic style of architecture of the Geometric period. In form it is a Latin cross, the transverse limb and the lower limb being devoted to school purposes; the other limb to the chancel, with organ chamber, vestry for clergy and choir, on the south side. The walls are brickwork externally and internally. The roof is open timbered, and, in the chancel, is plastered between the rafters. The covering is of green slate, with red tile ridge, those in the chancel being of ornamental pattern. At the crux of the nave and transept is a bell cot, covered with lead, surmounted by a wrought-iron cross. The east gable is also in ornamental wrought iron. The chancel is fitted with altar-table, ledge, reredos, credence, and sedilia, clergy and choir stalls. Accommodation is provided for about 300. Adjoining is a teacher's residence. Mr. C. Lynam, of Stoke-upon-Trent, is the architect; and the contractor, Mr. John Stringer, of Sandbach. The bricks used were given by the Crewe Coal and Iron Company; the rest of the expense, including site, has been defrayed entirely by Lord Crewe, who is also paying the whole of the cost of rebuilding the chancel of Madeley parish church, and adding a new organ-chamber.

Middleton-one-Row.—The chief stone of a new church has been laid here. The rapid increase of the population of the village of Middleton-one-Row—the result of ironworks being established in its vicinity—has made it necessary that active exertions should be made with a view to meet their spiritual requirements. The site chosen is a slight declivity on the right-hand side at the entrance of the village, which overlooks the river Tees. The land has been presented by Mr. W. R. I. Hopkins, of Grey Towers, Cleveland, and 800*l.* of the 1,700*l.* required for the erection of the building, including the spire, have already been collected. The church is designed by Mr. J. Pritchett, of Darlington, in the Early Decorated style, and is to have,—nave, 50 ft. by 25 ft.; chancel, 23 ft. by 16 ft.; vestry, porch, tower, and spire. The east end, towards the village, is designed with a three-light window rising into the gable, which is surrounded by a floriated cross. At the south-east angle of the nave are a tower and spire, square at the lower part, and surmounted by an octagonal lantern and spire, rising to a height of about 100 ft. The south side of the church is designed with a porch in the westernmost bay; the other bays being occupied by two-light windows, between buttresses. The west end has two single-light windows, surmounted by a rose-window, set in a lofty gable. On the north side the western bay is occupied by the vestry, and the others have two-light windows corresponding with those on the south side. On the north side of the chancel is a small organ-chamber. The whole of the walls are to be faced with stone from Waskerley, with dressings of ashlar. Internally, the church will, for its size, have a spacious effect, owing to the height of the roofs, that over the nave being of the curved brace form, open to the apex, and that of the chancel being wagon-headed—all of pine, varnished. The chancel arch is to be moulded, with carved caps and marble shafts. The seats, which are all to be low and open, with slanting backs, are to be of pine, varnished, and will afford accommodation for about 220 adults. The pulpit, font, reredos, prayer-desk, and lectern, are to be the gift of Mrs. Wooler, and to be designed by the architect in a style commensurate with the character of the church. The former will be of Caen stone, carved, and relieved with marble pillars. The desk will be of oak, carved and French polished, and the lectern of iron and brass. The windows are all to be filled with cathedral-tinted glass, with coloured margins. The floors of the chancel and passages are to be paved with mosaic tiles. The works are to be carried out under the superintendence of Mr. Pritchett, and the contracts have been taken by the following tradesmen:—Masonry, Mr. Jas. Dodgson, Northallerton; slating, Messrs. Atkinson & Sons, Darlington; plastering, Mr. Ormerod, Darlington; joiners' work, Messrs. Gargett & Son, Darlington; painting, Mr. Dryden, Darlington. The contracts, including the spire, amount to about 1,500*l.*; and the total expense, including warming, lighting, professional charges, furnishing, &c., will probably amount to about 1,700*l.*

Stratford (near Ipswich).—The ancient church of Stratford St. Andrew, on the high road between Ipswich and Lowestoft, about three miles from Saxmundham, has been re-opened. The peal of bells has been restored by Messrs. Warner, of London. Two out of the three were cracked almost from time immemorial. The tower itself is as yet untouched for want of funds. A vestry has been erected at the north-east corner of the chancel, in place of an old building which was commonly called the bone-house, and a special entrance connects it with the church. It is well known how unwilling the farmers of a parish are to give up their right of entrance by the chancel door. In this case it has been met by the walling off of a part of the vestry, which gives a sufficient vestibule for the use of those whose seats are in that part of the building. In the interior are benches, the whole sitting-room being for 160. In the chancel, coloured tiles form the flooring: they are continued within the communion-rails, and form a part of the reredos. The text over the table is, "Ye do show the Lord's death till He come." The gallery at the west end is removed, and every window in the church except one is new. The architect employed was Mr. Peck, of London, who also erected Framlingham College. He made a present to the parish of all the plans, besides giving his own personal supervision. The builder was Mr. George Carter, of Saxmundham, who erected the Saxmundham Rectory, and restored Carlton Church.

Books Received.

Prometheus Vinctus. Translated from the Greek of Æschylus into English verse. By ERNEST LANG. Smart & Allen, London. 1870.

THIS little book adds one more to the list of well-meant attempts to reproduce as English poetry the beauties of the classical dramas and epics. Though all such works of course are undertaken "not so much for the benefit of the scholar as for those who have been prevented from closely pursuing a classical line of study," it becomes the scholar's duty to watch over the interests of his favourites, and see that they are not misrepresented by the translator. He requires that not merely the sentiments, but the character of the original should be presented to the public. We have here the sentiments of the "Prometheus" rendered into English as faithfully as can be expected in a poetical translation. But we cannot say quite so much for the character. The metre chosen by Mr. Lang has proved a difficulty. The heroic couplet, which has become the property less of the poet than of the rhymemaker, which has been discarded from any worthy place in English tragedy, might do for the comedies of Aristophanes, or possibly for Euripides in his weakest moments of philosophical platitudes, but is not adapted for the vigour of Æschylus's iambics. In many places we have a nicely-turned phrase, and the chorus beginning at the bottom of page 28, though not Æschylus, makes a pretty little poem of itself, giving promise of better things. Should the author try his hand at Æschylus again, he could not take a better example in respect of metre than the "Prometheus Unbound" of Shelley, where the vigour of the blank verse and the richness of the lyrical choruses recall to us some of the spirit of the father of tragedy himself. Mr. Lang is but beginning his career, and will doubtless be heard of again.

Workmen's International Exhibition.—The number of visitors, exclusive of season ticket holders, exhibitors, and others, for the week ending the 14th inst., was 42,296.

Miscellanea.

The Meat Market and Proposed New Poultry Market.—At the last Court of Common Council, the court considered reports from the Markets Improvement Committee as to their proceedings in connexion with the new meat-market, and as to the best mode of utilising the vacant land on the west side of the market, and for authority to give directions for the preparation of a design, plans, estimates, &c., for the erection of a poultry-market on the south side of Charterhouse-street, and to lay the same before the court. Mr. Deputy Lowman Taylor, the chairman of the committee, said there had been expended for the purchase of land and premises, &c., required for the site of the market and the surrounding streets, 331,462*l.* 10*s.* 2*d.*; for making roads, including 7,850*l.*, the cost of the central roadway through the market, 31,079*l.* 14*s.*; interest on temporary loans, 38,316*l.* 11*s.* 8*d.*; making a total of 400,858*l.* 15*s.* 10*d.* as the cost of the site and roadways. As to construction, the cost of the market, including substructure, fittings, and sundry other expenses, was 278,503*l.* These two amounts together were 684,361*l.* 15*s.* 10*d.*, or, in round figures, 700,000*l.* Taking 700,000*l.* at 4½ per cent., the interest amounted to 31,500*l.* On the other hand, the net income for the year was 38,410*l.* The market had been a great success. Western Approach-street was an entirely different question. The expense of it was 296,555*l.*, and nothing had been done at present with the land on either side of the street to meet that outlay; and, to utilise a portion of that land, the committee proposed erecting a new poultry-market, which it was calculated would bring in a net profit of about 5,000*l.* Mr. Fricker moved an amendment to the effect that it was not desirable to erect another poultry-market, and that it be referred to the Markets Committee to consider the desirability of enlarging the present poultry-market at Leadenhall. A discussion of some length ensued, in the course of which Mr. Bedford disputed the correctness of Mr. Deputy Taylor's figures. In the result, the amendment was lost, and the reports were adopted.

The Widening of Newgate-street.—At the last meeting of the Court of Common Council, Mr. Rudkin brought forward a resolution as to the desirability of completing the widening of Newgate-street on the north side as soon as possible, and with that view referring it for consideration and report. The leases had now fallen in, and the tenants were under six months' notices. The opening of the viaduct could not be considered complete until Newgate-street was widened. Mr. Lusher said Newgate-street did not require to be widened. He complained of the desolation caused by the Holborn-valley works in the ward of which he was a member. Land said to be worth a million and a half of money was lying waste, and although Paris were bombarded for a month, it could not be made worse than that part of the City. He thought the ground should be put up to public competition. Mr. Bedford agreed with Mr. Lusher, and objected to another house being pulled down until the unoccupied land was let. Mr. J. E. Saunders said that the Metropolitan Board of Works and the Commissioners of Sewers had tried public competition, and had failed. The fact was, that a wrong plan had been pursued. Instead of compensating tenants and driving them away to the suburbs, an arrangement ought to have been made with them to rebuild their houses on as nearly as possible the same spot, and thus the same population would have been retained. The proposition was adopted.

Nuisance from Gas Refuse.—The Canterbury Gas Company have been heavily fined for contaminating several wells adjoining their works by allowing the escape of certain poisonous matter, which percolated the soil, and ultimately found its way into the water. In defence it was urged that the grievance was but a continuation of an ancient one, which had been condoned for by an arrangement that the parties aggrieved should be supplied with water from the company's services at a reduced rate or gratuitously. The evidence showed that the company had cut off their supply from their old works, and the complainants objected to taking the new water. The magistrates had but one case before them, and in this they fined the company 20*l.* penalty, with 10*s.* per day since the notice had been served upon them to remedy the evil.

The Architectural and Archæological Society of Durham and Northumberland. This society made its annual excursion and held its fourth annual meeting in North Yorkshire on the 15th and 16th instant. The meeting-place was Coxwold. The Rev. Canon Greenwell, of Durham, the president, was accompanied by the Rev. E. Greatorex, and Mr. J. Booth, jun., of Durham, honorary secretaries; Rev. J. F. Hodgson, vicar of Hutton; Rev. T. Rogers, Durham; Rev. J. F. Bigge, vicar of Stamfordham, Northumberland; Rev. J. Simpson, vicar of Kirkby-Stephen; Rev. R. G. L. Blenkinsopp, rector of Shadforth; Rev. A. A. Philpotts, vicar of Harton; Rev. J. G. Pearson, vicar of Darlington; Rev. S. R. Coxe, Hurworth; Mr. E. Mather, Newcastle; Mr. J. C. Langlands, Old Bewick; Mr. R. Bowser, Bishop Auckland; Mr. and Mrs. R. S. Carr, Farnley Grange; Mr. and Mrs. Booth, Shotley Bridge; Mr. and Mrs. R. N. Robson, Durham; Mr. Bagley, Durham; Mr. W. H. D. Longstaffe, Gateshead; Mr. H. Chaytor, Witton Castle; Mr. J. W. Kirk, Sunderland; Rev. H. H. Bishop, Sunderland; Mr. Pritchett, Darlington; Rev. Mr. Grey, vicar of Helmsley, and other ladies and gentlemen. Amongst the places visited were the old church of the Fauconbergs at Coxwold; "Shandy Hall," once the residence of Lawrence Sterne; the Priory of Newburgh (Sir G. O. Wombwell's seat), Byland Abbey, Scawton Church, Rievaulx Abbey, and several places and objects of interest.

London Tramways.—The authorities of the northern metropolitan districts have received notices from the Metropolis Street Tramways Company of the intention of the company to forthwith commence their works for the laying of their tramways. The first section, it is understood, will be from the Holloway-road, near the Nag's Head, through the parish of Islington, along the Camden-road to the Brecknock Arms, thence continuing through St. Pancras down the Camden-road, passing the Midland and Camden-road Station of the North London Railway to the Red Cap, turning into the High-street, Camden-town, and along the Hampstead-road to the Euston-road, which is to be the terminus to the first section. A number of excavators have commenced breaking up the main road and laying down metals for extending the South London Tramway from its present starting-point (near the police station) to the cross roads at Brixton Church. The tramway from Clapham to the junction at Kennington is now completed, and the line from this junction to the Hercules, at Westminster, is also about finished, and large tram-carriages will run from Brixton and Clapham to Westminster for public traffic. The omnibus fares are to be reduced to the low tariff charged on the tramway.

London and Middlesex Archaeological Society.—The annual excursion of the above society took place as we mentioned it would, and was largely attended. The members and their friends took train at Moorgate-street and King's-cross, and proceeded to Barnet, where omnibuses were in waiting to take them to the various points for which visits were marked out in the programme. The first stage was Hadley, where, in the parochial school-room, the society held its annual meeting, under the presidency of Mr. J. R. Tyssen, president of the society. Mr. W. H. Black addressed himself to the ancient topography of Barnet, and showed, by a great number of illustrative details, that in ancient times the township was the seat of a great Roman community and military station. Mr. Peacock followed with a paper on "Barnet and its Neighbourhood." The next stage of the excursion was the ancient parish church of Monken Hadley, where the rector, the Rev. F. C. Cass, read a paper on the topography of the parish, and the antiquities and monumental brasses of the church. The latter, it appeared, had been torn from their places, and put away "in a cupboard," where they were discovered by Mr. Cass, the present incumbent, and, after renovation replaced.

Paris and the War.—The *Official Journal* publishes the protest of the Institute of France against the eventual bombardment of the libraries, monuments, and museums.——M. Alphand, the well-known architect, in a letter to the editor of the *Figaro*, protests against a report that he showed to the King of Prussia the sewers and catacombs of Paris, and that he sent to him the plans of the same. He was never charged with the service in question, and never sent to King William plans of any description whatever.

Three Counties' Asylum Water-Supply, Hitchin.—The attempt to provide a good supply of water for the use of the Three Counties' Asylum, at Arlsey, near this town, has proved successful. The work of sinking a well was confided to Mr. Paten, of St. Alban's, formerly of Redbourn, who is known for his skill as a borer of artesian wells. It will be recollected by those who read the last two reports of the Lunatic Asylum Committee, that the ultimate success of finding water seemed very doubtful; the well having been sunk to a great depth, boring having been still deeper, and yet no water was found. But Mr. Paten was confident that all would come right at last. So the boring was continued, and at length, at a depth of nearly 500 ft., a splendid and never-failing supply of water was reached. The temporary pumps, worked by a 12-horse power steam-engine, have been throwing up 120,000 gallons of water daily; the estimated quantity required being 70,000 to 80,000 gallons. The borers went through the chalk formation, then through the gault, and the water was found in the old red sandstone.

Unveiling the Gladstone Statue.—The Mayor of Liverpool (Mr. Joseph Hubback) has performed the honorary ceremony of unveiling the statue of the Prime Minister of England, the Right Hon. William Ewart Gladstone, in presence of many members of the British Association, and others. It will be remembered that the statue was subscribed for some months ago by a number of Liverpool gentlemen of all classes and sects, who desired to pay a tribute of respect to their distinguished fellow-citizen. The statue was modelled and executed by Mr. Adams Acton. The artist has attired the figure in the robes of a Chancellor of the Exchequer. It is chiselled out of black-veined marble, and is a pure work of art. The statue is placed on the east side of the hall on the left of the central doorway, and in the niche next to the one that was recently filled up with the statue of the late Lord Derby. It therefore occupies a very prominent position in the hall. The grand hall was crowded in every part.

The Hungerford New Town Hall and Corn Exchange.—The corner-stone of a block of buildings, which will embrace a new Town Hall, and also a spacious Corn Exchange, has been laid in Hungerford. Mr. J. H. Money, of Speenhamland, is the architect. The site is on the west side of the High-street, at the Crown Brewery. A large portion of the cost will be covered by subscription. Mr. Hoskins, of Hungerford, is the contractor, and Mr. Low has taken a sub-contract for the glazing, painting, &c. The design is in the Italian style, and the building will have every accommodation for the public business of the town, besides which the Corn Exchange, which is 66 ft. by 30 ft., and immediately adjoining, will give ample space and convenience for large meetings. A gallery for ladies, or an orchestra, is provided, with access from the principal staircase, and also retiring-rooms, lavatories, &c.

The Proposed Public Buildings for West Bromwich.—A meeting has been held to consider the situation of the proposed new market and townhall. The chairman and several gentlemen protested against the Lodge Estate site, as that was completely out of the way of business, and an opinion was expressed that the site of the present market was the most eligible for the new one. After a slight discussion it was ultimately resolved, "That the commissioners be requested to consider, if it is intended to build a townhall and market-place, it is most desirable that the same should be separated from each other." It was also resolved, "That the commissioners be requested to reconsider their decision as to the site for a market, and to consider whether the site of the present market is not the most eligible for the purpose. That a memorial to the same effect be forwarded to the commissioners."

Fall of Flooring at Stockport.—A portion of the third or top story of Messrs. Wheeler & Faulder's fruit-preserving manufactory, Stockport, has fallen through, and a man casually employed at the works was killed on the spot. Another man, named Samuel Mather, was rescued from the *debris*, and is expected to recover. The flooring gave way under the pressure of a number of barrels of preserves, each weighing about 15 cwt. The firm employs between 200 and 300 hands during the summer and autumn months, and a number of them had a miraculous escape.

Leeds School of Art.—An exhibition of students' drawings and paintings has been opened in the Mechanics' Institution, in connexion with the School of Art there, carried on under the superintendence of Dr. Puckett, the head master. The various works are exhibited in the picture gallery, and they are 277 in number. At the school about 200 pupils attend, and as the works are all selected, and have been executed since August, 1869, a very fair amount of patient artistic labour is represented, chiefly of an elementary character. Of the pupils, nine have obtained third-grade prizes from the Science and Art Department, and twenty-six have had their works honourably mentioned or pronounced satisfactory; whilst twenty-five have been awarded local prizes. A large majority of the pupils attend the classes in the evening, many of them fresh from the workshop.

Excursion of the Worcester Architectural Society.—An excursion has been made by this society in a steamer down the Severn to Deerhurst and Tewkesbury. The weather was wet; but the deck was covered by an awning. About sixty persons were of the party. The seats of the Lechmeres, Coventrys, Beauchamps, Dowdeswells, and Martins, and many churches, were pointed out by the way; and scraps of family history, personal anecdote, and other interesting matter enlivened the party. At the notable old church of Deerhurst, the Rev. G. Butterworth, the incumbent, was the cicerone. The party partook of a cold collation at Tewkesbury, Sir Thomas Winnington in the chair; after which they visited the abbey, and the ladies were entertained at tea in the Abbey House, by Mr. and Mrs. Healing.

New Bridge at Malton. — The North-Eastern Railway Company have been sinking a cofferdam on the Malton side of the river Derwent, for the erection of a new iron girder bridge of two spans, the foundations of which, under the superintendence of Mr. John Baines, the engineer in charge, have been put in, the first iron pile in mid-stream having been driven under directions of Mr. Vester, the bridge superintendent. The excavation for the cofferdam was carried down to the gravel, 2 ft. 6 in. below the deepest part of the river. This excavation being situate about midway in the water-line of the supposed Roman town of Malton, the work was watched with care for relics. Singularly not a single article referable to Roman date has turned up.

Metropolitan Board of Education. — Efforts are being made for securing an efficient Board of Education for the metropolis under the new Education Act. Mr. George Moore has consented to become a candidate for the City of London, and Lord Sandon, M.P., and Mr. W. H. Smith, M.P., for Westminster. The names of Sir Francis Lycett, Mr. M'Cullagh Torrens, M.P., Mr. Hugh Owen, and Mr. William Rivington, are associated with Finsbury; Mr. C. Reed, M.P., with Hackney; and Mr. M'Arthur, M.P., with Lambeth. Mr. George Hanbury has promised his active assistance. An independent committee is being formed to secure the return of fitting representatives for all the divisions of the metropolis.

Pontefract.—In anticipation of increase in the population of this borough, in consequence of the opening out of a new coal-field, improvements are contemplated. It has already been arranged that Finkle-street, a very narrow thoroughfare and the principal road to the station, shall be widened at a cost of between 2,000*l.* and 3,000*l.* Another important project is also in hand, and that is the building of a new Corn Exchange, a building much needed.

Approaches to the Thames Embankment.—The Whitehall approach to the Victoria Embankment is now completed and opened for traffic. The works in connexion with the principal approach to the Embankment from Craven-street to Charing-cross are at a standstill, in consequence of a difficulty in obtaining possession of a small piece of land necessary to complete the approach.

The late Bishop of Carlisle.—A monument is about to be placed in Carlisle Cathedral, at a cost of 800*l.*, to the memory of the late bishop of the diocese, Dr. Waldegrave, the joint design of Mr. Adams, the sculptor, and Mr. T. H. Watson, the architect. The figure, in statuary marble, will be recumbent, with canopied superstructure and foliated brass standards.

Surveyorship of St. John's Parish, Hampstead.—At their meeting, on Monday, the 19th inst., the Vestry elected as their surveyor Mr. Thomas W. Gardner, C.E., F.G.S., who, we learn, has had long experience on extensive hydraulic and sanitary works in England, Russia, and India. There were eighty-five candidates for the appointment.

TENDERS.

For Presbyterian schools, Kensington, Liverpool. Mr. W. J. Mason, architect. Quantities by Mr. G. Northcroft:—

Corbett	£1,416 0 0
Rome	1,370 0 0
Tomkinson	1,350 0 0
Readdie	1,337 0 0
Litt & Wilkinson	1,289 7 0
Urmson	1,272 0 0
Bateman	1,271 0 0
Nicholson & Ayre	1,248 0 0
Haigh & Co.	1,247 0 0
Potter, Brothers (accepted)	1,180 0 0

For Welsh Independent Chapel, Hermon, Anglesey. Mr. R. G. Thomas, architect:—

Roberts (accepted)	£599 0 0

For Welsh Independent Chapel, Paradwys, Anglesey. Mr. R. G. Thomas, architect:—

Lloyd (accepted)	£786 0 0

For Welsh Calvinistic Methodist Chapel, Bangor. Mr. R. G. Thomas, architect:—

Thomas & Sons (accepted)	£900 0 0

For billiard-room, &c., for the Right Hon. Lord Clarence E. Paget, K.C.B., at Plas Llanfair, Anglesey. Mr. R. G. Thomas, architect:—

Salisbury (accepted)	£356 10 0

For girls' and infants' schools, Bromley, E., for Mr. Arthur Currie. Mr. John W. Morris, architect:—

Heiser	£2,415 0 0
Ennor	2,389 0 0
Tanner	2,358 0 0
Kilby	2,353 0 0
Watts	2,349 0 0
Wicks & Bangs	2,331 0 0
Abraham	2,297 0 0
Sheffield	2,288 0 0
Mann	2,283 0 0
Hill, Keddell, & Waldram	2,240 0 0
Perry	2,239 0 0
Atherton & Latta (accepted)	2,005 0 0

For new buildings, at the Grange, Bermondsey, for Messrs. Barrow, Brothers. Mr. Geo. Elkington, architect:—

Tarrant	£932 0 0
Kent	890 0 0
Little	796 0 0
Wells	700 0 0
Shepherd (accepted)	695 0 0

For alterations, &c., to the Admiral Codrington Arms, Green-street, Chelsea, exclusive of pewterer's work. Mr. J. Bradbury, architect:—

Rhodes	£173 0 0
Knight (accepted)	130 0 0
Nixon	122 19 0

For alterations, &c., to two houses, Cumberland-street, Chelsea. Mr. J. Bradbury, architect:—

Cox (accepted)	£150 0 0

For alterations to offices, 115, Leadenhall-street, for the Realm Building and Investment Company. Mr. John W. Morris, architect:—

J. Sheffield	£60 0 0
A. Sheffield	53 0 0
Harris & Wardrop	47 12 0

TO CORRESPONDENTS.

G. B.—J. M. A.—R. C. P.—C. S. A.—J. K.—C. C. H.—E. A.—G. H. S.—W. M.—H. S. (the "painting match" has not come off).—H. A. (send whole complete. No hurry).—T. L. B.—J. N. M.—K. & O'D.—J. B.—A Working Man.—J. G. N.—Constant Reader.—W. W.—R. W.—R. P.—W. G. H. & P.—Redditch.—D. & F.—X. Y.—V. G.—P. W.—O. P. & Son.—T. G.—L. M. F.—J. D. H. (too late for this week).—E. S. (ditto).—M. & Son.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

NOTICE TO SUBSCRIBERS.

The Publisher cannot be responsible for TESTIMONIALS *left at the Office in reply to Advertisements, and strongly recommends that* COPIES ONLY *should be sent.*

Advertisements cannot be received for the current week's issue later than **THREE o'clock, p.m.,** *on THURSDAY.*

☞ *NOTICE.—All Communications respecting Advertisements, Subscriptions, &c., should be addressed to "The Publisher of the Builder," No. 1, York-street, Covent Garden. All other Communications should be addressed to the "Editor," and* NOT *to the "Publisher."*

SPECIAL NOTICE.

In consequence of the Reduction in the Newspaper Postage, Subscribers will be supplied with THE BUILDER *direct from the Office, at the rate of Nineteen Shillings per annum,* PAYABLE IN ADVANCE. *This arrangement will take effect from Friday, 7th October.*

ADVERTISEMENTS.

"THE BUILDER."

WANTED (BOUND or UNBOUND), the Numbers for the Years 1859, 1862, 1863, 1864, 1865, and 1866, complete. — Address, with price and full particulars, to Mr. FOURDRINIER, at the Office.

Published at 15*s.* now reduced to 4*s.* 6*d.* post-free.

IRON ROOFS: a Theoretical and Practical Treatise on their Construction. By FRANCIS CAMPIN, C.E. Past-President Civ. and Mech. Eng. Society, &c. With Woodcuts and Lithographic Plates of Roofs lately executed. 4to. sewed.
London: B. T. BATSFORD, Architectural and Engineering Bookseller, 52, High Holborn, W.C.

In a few days, with 19 plates, demy 8vo. 10*s.* 6*d.*

CHURCH DESIGN for CONGREGATIONS By JAMES CUBITT, Architect. SMITH, ELDER, & CO. 15, Waterloo-place.

Just out.

RIDDELL.—The NEW ELEMENTS of HAND-RAILING, in concise Problems, calculated to bring this most useful science within the reach of every capacity. By ROBERT RIDDELL. 4to. cloth, pp. 126 and 40 plates. 1*l.* 1*s.*
Also, by the same Author,
The CARPENTER and JOINER. 4to. cloth, pp. 28 and 34 plates. 1*l.* 1*s.*
London: TRUBNER & CO. Paternoster-row.

POST CARDS.—Pursuant to an Act passed in the last Session of Parliament (33 and 34 Vic. cap. 79), POST CARDS have been prepared for correspondence by post in the United Kingdom after the 30th of the present month, stamped with the postage duty of one halfpenny.

These cards will be sold without any charge beyond the duty.

A single card, or any number of cards, may be purchased, but they will be sent out from this office in packets, containing 24 cards, price 1*s.*; and in parcels of 20 packets, price 1*l.* They may be obtained at all post offices and from licensed vendors of stamps.

The cards will also be supplied, when required, in sheets, containing 42 cards, and measuring about 29½ by 21½. Although the cards may thus be obtained in sheets, for the purpose of affording facility for printing upon them, each card must afterwards be separated from the sheet, as no combination of cards can pass through the post-office.

Such sheets will be issued only in half-reams, containing 240 sheets (10,080 cards), duty 21*l.* and will be supplied to the public at the Inland Revenue Offices at London, Edinburgh, and Dublin, and at the offices of the distributors and sub-distributors of stamps in the country. A discount of 4*s.* per half-ream will be allowed to purchasers.

When a supply of cards, in sheets, is required, elsewhere than in London, Edinburgh, or Dublin, application, in writing, must be made to the Warehouse-keeper at this office; or at the Inland Revenue Office, in Edinburgh or Dublin, as the case may be. Such application must specify the quantity required, and the town or place having a stamp-office, to which it is desired that the consignment should be made.

The applicants will have notice when they are to call at the stamp-office and pay the duty.

Post cards cannot be used before the 1st October.

Those made up in packets will not be sold before that date, but cards in sheets will be supplied by this office on and after 26th instant, to enable the public to print on them, preparatory to their use next month.

It is desirable that persons requiring cards in sheets should make early application for them. By order of the Board,
T. SARGENT, Secretary.

Inland Revenue, Somerset House, 9th September, 1870.

WRAPPERS for NEWSPAPERS and other PRINTED MATTER.—The Board of Revenue desire to give Notice that SHEETS of PAPER for Wrappers for Newspapers, Book Packets, and Pattern or Sample Packets, can be IMPRESSED with the HALFPENNY POSTAGE STAMP, under the following regulations:—

1st.—The paper must be white, and must neither be folded nor creased.

2nd.—The size of the sheets must be double crown, double demy, or double royal.

3rd.—Each sheet must be prepared to receive eight, twelve, or sixteen stamps; no other numbers can be impressed, and the stamps can be impressed only in the positions and at the distances apart indicated upon pattern sheets, which may be seen at the Head Offices at London, Edinburgh, and Dublin.

4th.—The stamp will be impressed immediately above the place for the address, and near the right-hand edge of the wrapper. To give space for the stamp, any printing upon the sheets should be kept 1½ inch clear of what is to be the right-hand edge of the wrapper.

5th.—Each lot sent in must be accompanied by a sheet marked, to show in accordance with which of the patterns it is desired that the stamps should be placed.

6th.—The paper must be delivered at the offices above mentioned, in reams of 480 sheets.

7th.—No less than two reams for one description of wrapper can be received for stamping.

8th.—Any sheets found to have been injured in the process of stamping may be returned to this office, with an equal number of fresh sheets, on the next occasion of similar sheets being sent in, when the stamps will be transferred.

9th.—When the paper is brought for stamping, a person must attend at the Department of the Receiver-General, to fill up the necessary warrant, and to pay the amount of the stamps required. No discount is allowed.

10th.—Persons in the country must not send to the offices through the post or by carriers, but must send through an agent.

By order of the Board, T. SARGENT.
Inland Revenue, Somerset House, London, 9th September, 1870.

T. A. RICHARDSON, ARCHITECTURAL ARTIST, late of Symond's Inn.—PERSPECTIVES in OUTLINE or COLOUR. Highest references. Moderate terms. Established eighteen years.—302, Gray's-inn-road, W.C.

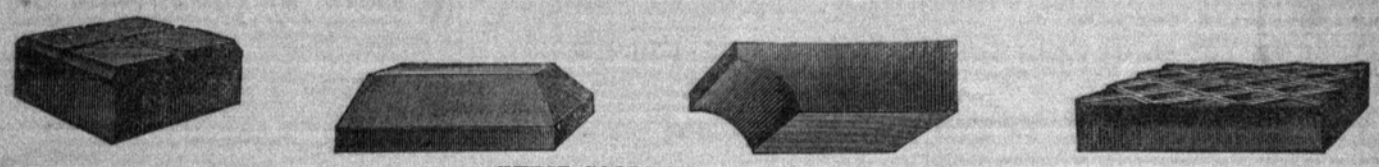
PARTNERSHIP.—HALF SHARE of an ARCHITECT and SURVEYOR'S PRACTICE TO BE DISPOSED OF.—Address, 419, Office of "The Builder."

PARTNERSHIP.—An Architect and Surveyor, who has had considerable experience in two of the first offices in London, as well as for the last five years on his own account, would be glad to negotiate for a SHARE in an old-established PRACTICE in London, capable of being enlarged by an increasing connexion of his own. Communications will be considered confidential.—Address, A. B. Messrs. Anderson & Son, Solicitors, 17, Ironmonger-lane, Cheapside.

DOULTON & CO.

HAVING EXTENSIVE WORKS IN
LAMBETH, the MIDLAND DISTRICT, and the NORTH, can ECONOMISE the Cost of Carriage,
And are thus able to Supply their various Manufactures at the Lowest possible Prices
In any Part of the Kingdom; and can also export from London, Liverpool, or Gloucester.

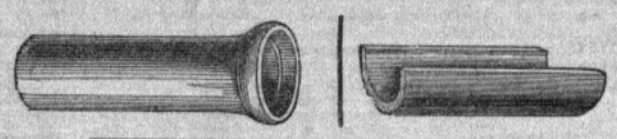
BLUE STAFFORDSHIRE WARE.



THESE GOODS MAY BE CONSIGNED
DIRECT to ANY PART of the COUNTRY, put into BOATS at the WORKS at Rowley, or into TRUCKS at the RAILWAY STATIONS adjoining.
MAY BE HAD IN LONDON, at their WHARFS at
LAMBETH, OR CROWN WHARF, VICTORIA PARK, E.
Or may be sent by Rail direct to ST. PANCRAS, CAMDEN, or PADDINGTON STATIONS; also at
GRANVILLE WHARF, BIRMINGHAM; and SOHO STREET, LIVERPOOL.

DOULTON'S STONEWARE PIPES.

PIPES FOR DRAINAGE,
From 2 in. to 30 in. in diameter.



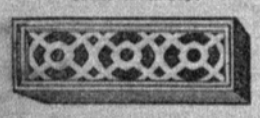
CARRIERS FOR SEWAGE, &c.
With or without Sockets.

DOULTON'S ARCHITECTURAL TERRA COTTA.

Messrs. DOULTON & CO. are now paying special attention to this branch of their Manufacture, and invite Architects and Builders to view their STOCK at LAMBETH. Specimens also on view at the Crystal Palace; and at the Architectural Museum, Conduit-street, W.

TERRA-COTTA of EVERY KIND MANUFACTURED by DOULTON & CO.

AIR BRICK.

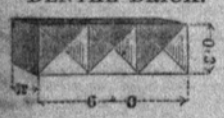


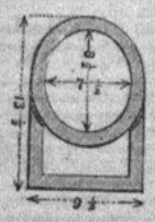
COMBINED SMOKE AND AIR FLUE.

CHIMNEY PARTITION.

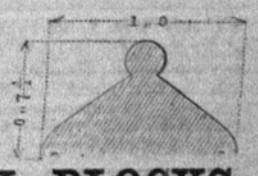
WALL COPINGS.

DENTAL BRICK.





STONEWARE SINK.



DOULTON'S PATENT INVERT AND JUNCTION BLOCKS,
And IMPROVED STREET and YARD GULLIES.

DUTCH TILES; RED, BLUE, and BUFF PAVING TILES; AIR BRICKS; DAMP PROOF COURSE, &c.

STONEWARE SINKS, highly Glazed, of great Strength, Incorrosive and Non-absorbent.

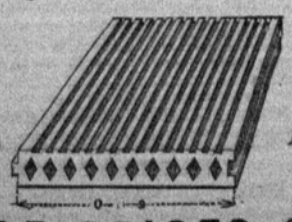
ALL KINDS OF SANITARY WARE.

Fire-clay Goods of all kinds. Plumbago and other Crucibles.

All descriptions of GENERAL STONEWARE, CHEMICAL APPARATUS, FILTERS, AIR-TIGHT JARS, BOTTLES, &c. for Exportation.

DOULTON'S

IMPROVED DAMP



PROOF COURSE.

SEE SEPARATE ADVERTISEMENT.

SEPARATE LISTS OF PRICES ON APPLICATION.

CLERK of WORKS WANTED, for a few months, to carry out some Drainage Works. Must be experienced in such works and if able to use the level preferred.—Apply, stating age, qualifications, references, &c. to F. Post-office, Stroud, Gloucestershire.

FOREMAN of WORKS WANTED, by a London Building Firm. Must be an experienced and energetic man, with good references.—Address, 361, Office of "The Builder."

JUNIOR CLERK.—WANTED, a Man accustomed to the duties of a Builder's Office, able to take out quantities, and make a plain drawing. Wages 20s. per week.—Address, by letter, W. A. PETERS, Builder, Rochdale.

RESIDENT PUPIL.—A CIVIL ENGINEER, residing near London, has a VACANCY for a RESIDENT PUPIL, who will have the opportunity of acquiring a practical knowledge of drainage and sanitary work, road-making, surveying, levelling, &c. Mr. Phillips, of Swansea, is requested to communicate address.—Address, S. E. Office of "The Builder."

SLOUGH LOCAL GOVERNMENT BOARD.—APPOINTMENT of SURVEYOR.—The Slough Local Government Board propose, on WEDNESDAY, the 28th of SEPTEMBER instant, to proceed to the ELECTION of a SURVEYOR and INSPECTOR of NUISANCES for the District of the Board. Applications of candidates must be made in writing, addressed to the Clerk, and state the age of the applicant, and be accompanied by testimonials. They must be sent to the Office of the Board, High-street, Slough, on or before the 26th of SEPTEMBER instant. The salary will be 200*l.* per annum; and the duties of the office are defined by the bye-laws of the Board, which can be seen at the Office of the Board.—By order of the Board,

CHAS. THOS. PHILLIPS, Clerk.

Slough, September 8, 1870.

SEFTON HIGHWAY BOARD. — The Board require the services of a person qualified to act as DISTRICT SURVEYOR. His duties will be to carry into effect all the works and perform all the duties required by the Board, in the execution of the Repairs or Reconstruction of the Highways within the District of the Board, to devote the whole of his time to the performance of his duties, to prepare all necessary plans, take levels, and superintend all the new works and repairs, and keep the Surveyor's books and accounts, at a salary of 100*l.* per annum.—Applications, with testimonials, to be sent in, addressed to me, on or before FRIDAY, the 30th of SEPTEMBER inst.

SAML. P. BRABNER, Clerk to the said Board.

40, North John-street, Liverpool, September 9, 1870.

STRAND UNION. — To WORKING ENGINEERS.—The Guardians of the Poor of the Strand Union require a practical ENGINEER for the New Workhouse at Edmonton. Salary 2*l.* per week, with rations, lodging, and washing. Applications, in the handwriting of the candidate, stating age and present and previous occupations, are to be sent, with testimonials, to me on or before MONDAY, the 3rd of OCTOBER next. No person need apply who cannot produce satisfactory testimonials as to his fitness for the office. Particulars may be obtained on application at the Office, No. 6, Bow-street. Those deemed eligible will receive notice to attend on a subsequent day, when the election will take place.—By order,

September 22nd, 1870. JOHN JEFFREY, Clerk.

THE GAS-METER WORKS, Kingsland-road.—WANTED, a RESIDENT MANAGER, to superintend the manufacturing and sale departments. He must be a thorough business man, experienced in the management of large undertakings.—Address, stating age, salary required, past employments, and special qualifications to GEORGE HAIT, Managing Director, Gas-meter Company, Limited, 15, Coleman-street, City, E.C.

WANTED, a CLERK in a Builder's Office. One that understands the business, and has been used to the house agency and the collecting of rents preferred. Salary not more than 30*s.* per week. Also a Youth, apply in his own handwriting.—Address, C. C. Mr. Roberts, 195, Shoreditch.

TO TRAVELLERS AND OTHERS.

WANTED, a Person who has a connexion amongst builders and buyers of Fire Clay Goods, to SOLICIT ORDERS for BUILDING MATERIALS and FIRE CLAY GOODS. Will be paid partly by salary and partly by commission.—Address, stating salary and commission required, ALPHA, Office of "The Builder."

WANTED, a FOREMAN, in an ENGINEER'S SHOP.—Address, stating full particulars as to qualifications, age, wages required, &c. to E. N. G. 12, London-wall, E.C.

WANTED, by an experienced middle-aged Man, a JOINER by Trade, a SITUATION to WORK a MOULDING MACHINE, General Joiner, or Saw Bench, either plain or ground-off saw. Can make his own cutters. Ten years' character.—Address, J. COAST, 9, Sidney-square, Mile-end-road, E.

TO ARCHITECTS AND SURVEYORS.

WANTED, by the Advertiser, a RE-ENGAGEMENT, in an Architect's Office. Five years and a half experience.—Address, W. D. 103, Manor-street, Chelsea.

TO BUILDERS AND CONTRACTORS.

WANTED, by a practical and sober MASON, a RE-ENGAGEMENT as GENERAL or WORKING FOREMAN, or to take the entire Charge of a Job. Six years' character as to ability, &c. will be given.—Address, G. LONG, Frampton-on-Severn-Church, Gloucestershire.

WANTED, a SITUATION, by a thorough practical BUILDER'S CLERK. Been used to collecting money, booking men's time, work, materials, &c. Bookkeeping, correspondence, and general office work in a builder's and contractor's office. Age 24 years. First-class references.—Address, C. M. 213, Kingsland-road, E.

WANTED, a SITUATION, as IMPROVER to the CARPENTERING and JOINERING. Aged 22.—Address, J. F. G. 6, Market-street, St. James's.

TO GENTLEMEN ABOUT TO BUILD, CONTRACTORS, &c.

WANTED, by a practical Man, of many years' experience in all kinds of building operations, the management of men, &c. a SITUATION as GENERAL FOREMAN, or CLERK of WORKS, or would Take any amount of Work by the Piece. Good testimonials. No objection to go abroad.—Address, J. H. 4, Winstanley-road, Clapham Junction.

TO UPHOLSTERERS AND DECORATORS.

WANTED, an ENGAGEMENT, by a DECORATIVE ARTIST, of first-rate experience. The Advertiser, being a good draughtsman, would be found of great use in a decorator and upholsterer's establishment.—Address, 370, Office of "The Builder."

TO BUILDERS AND OTHERS.

WANTED, by a thoroughly efficient and energetic Shop Foreman of Joinery, a RE-ENGAGEMENT, either as SHOP or GENERAL FOREMAN. Is a good draughtsman, also accustomed to machinery. Aged 42.—Address, T. E. 30, Sussex-street, Warwick-square, Pimlico.

TO BUILDERS AND OTHERS.

WANTED, a SITUATION, in a JOBBING SHOP, where he can insure a constancy. Very steady and respectable.—Address, G. D. 7, High-street, Ealing.

WANTED, by the Advertiser, a SITUATION as MOULDER or BURNER in the Terra-cotta or Stoneware line. Good references. Would not object to going abroad.—Address, J. H. No. 3, Railway-place, York-road, Commercial-road, London, E.

WANTED, a RE-ENGAGEMENT, as FOREMAN of BRICKLAYERS, or to Take Charge of a Job. Well up to repairing jobs. Very good references.—Address, C. R. 85, Fairleigh-road, Stoke Newington.

TO BUILDERS, &c.

WANTED, a RE-ENGAGEMENT, as BUILDER'S CLERK. Age 25. Has served some time at the practical part, used to measure up work, take out quantities, quick at figures. Good draughtsman. Salary moderate. First class personal references.—Address, S. N. B. No. 58, Albany-street Regent's Park, N.W.

WANTED, a RE-ENGAGEMENT, as JUNIOR ASSISTANT. Neat draughtsman. Good references.—Apply, J. R. B. 5, Euston-street, Euston-square, N.W.

WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN, or a Temporary Engagement as Foreman of Works. Has good practical knowledge of the different branches. Can set out and measure bricklayer's, carpenter's, and other works, prepare working drawings, take out quantities, and estimate if required. Carpenter by trade. Town or country. Good testimonials for ability, sobriety, &c. Wages moderate.—Address, T. B. 19, Richmond-terrace, opposite Uxbridge-road Railway Station.

WANTED, a SITUATION, in a QUANTITY SURVEYOR'S Office. Can abstract and bill quickly, &c. &c. Over three years' experience. Good references.—J. G. T. 20, Dame-street, Islington, N.

TO BUILDERS AND DECORATORS.

WANTED, by a respectable middle-aged Man, a SITUATION as WORKING FOREMAN of PAINTERS. Good reference as to character and sobriety.—Address, Y. Z. 17, Clarendon-square, Euston-road, N.W.

TO ARCHITECTS.

WANTED, a RE-ENGAGEMENT, as JUNIOR ASSISTANT, by a neat and efficient DRAUGHTSMAN, who has had four years' experience, and is well up in the general routine of an office. Excellent references, &c.—Address, A. Y. Z. 9, Crawford-street, Camberwell.

TO BUILDERS AND DECORATORS.

WANTED, by a good GLASS and SIGN WRITER, a permanent SITUATION. Would not object to fill up his time at the brush.—Address, 402, Office of "The Builder."

TO ARCHITECTS AND BUILDERS.

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The Builder.

VOL. XXVIII.—No. 1443.

The Social Science Association in Newcastle-on-Tyne.

A VERY agreeable and useful week has been spent by the Social Science Association in Newcastle. Several excellent papers, two or three remarkable indeed, have been read, and a large amount of very valuable discussion has taken place. It is to be regretted that much of this is necessarily unrecorded, and that what is fixed by the short-hand writer scarcely gets so wide a publicity as is desirable. The local press have done well in this respect, but the London papers find the amount of matter too much for them, especially in such days as these, when the mad doings of foreign nations demand so much space, and they are able to do little more than report the departmental addresses and to catalogue the headings of some of the papers. If the annual volume published by the Association could be quickly issued, and the subscriptions of the public would admit of its wide distribution free to public libraries, literary institutions, working men's clubs, and elsewhere, much good would be done. We cannot pretend to supply in any degree the deficiency of publication to which we refer. We can but touch a point here and there, and keep attention alive. We must add to what we have said as to the success of the Congress in respect of work done, that the word can scarcely be used as regards the numbers attending, when we consider the size and character of the town. About 900 tickets, we believe, were sold, a number much less than was anticipated. On the other hand, those inhabitants of the town who did take the matter up, were most active in their endeavours to render the week profitable, and co-operated with Mr. Edwin Pears, the able general secretary, in every practicable way. Hospitality was general. The Duke of Northumberland, president of the year, Sir William Armstrong, the Mayor of Newcastle, and others, entertained liberally, and many of the active members of the Association from London and elsewhere were received into the houses of the inhabitants. The banquet at Sir William Armstrong's residence, Jesmond (Jesus' Mount), was especially noticeable. The banqueting-hall, built a few years ago under the direction of the late Mr. Dobson, and the reception-room, quite recently completed from the designs of Mr. Norman Shaw, are of striking character, and of a size not often found in a private residence. The walls of the hall are of buff bricks, with red brick dressings; the roof of timber open. A wide arched opening, in the upper part of which is a music gallery, with organ, unites the hall to the reception-room. The circular arch, we may say, is used throughout: and the apartments, being erected in a Dene, are approached by long flights of steps from the higher level above. About 230 visitors dined on the occasion in question; the dinner was admirably served, and amongst the speakers afterwards the host and Sir Stafford Northcote were more particularly happy.

The address in the Town-hall with which the Duke of Northumberland opened the Congress did not wholly escape criticism: it had a reactionary tone, seemed not quite certain as to the result of general education, and viewed timidly all innovation: still it included many excellent observations.

The first departmental address was given by Mr. G. W. Hastings, as Chairman of Council, and reviewed the work of the Association to secure an improved and extended system of national education. The question might have been settled years ago, he said, if the counsels of the Association had been followed, and thus the long period would have been saved which had been lost in sectarian jealousy and judicial apathy. Thanks, however, to Mr. Foster and to the moderation of the House of Commons, the country had at last obtained in the Act of this year the broad outline of a national system of primary education. The measure might not be all that the friends of education desired, but it was at least a practical measure, and a great improvement on that which had preceded it, and to which the country owed much. One thing was at once required to make the present system work efficiently, and that was the appointment of a Minister of Education. Until such a step was taken the work of the educational department would not be performed in an efficient manner or the educational machinery work harmoniously. Their vice-president, Earl Russell, had endeavoured to obtain the appointment of a Minister of Education, but his amendment to that effect had been defeated. It was clear, however, in his opinion, that the time was at hand when a central organisation should be formed such as that which had been advocated by the vice-president of the Association. We quote a few further sentences from Mr. Hastings's address. "Not only," said he, "have we much to learn, we have also much to give up. We must abandon that exclusiveness which, in education as in other things, is too prominent a characteristic of Englishmen. Access to our universities must be made more easy, and the benefits of our ancient endowments must be more impartially distributed. We must place within reach of all classes of the community the highest culture which the country can impart; we must take away all excuse for ignorance; we must, it may be, compel those who are unwilling to come in. Not until this has been done can we hope to become a cultured nation; and it is in the conviction that the Association, which by its discussions and publications and the action of its council has already done so much in the sacred cause, will not relax its efforts in the new fields now open to be won, that I have dwelt, perhaps, too long—though how much remains to be said!—on this great question of education." Mr. Hastings then adverted to the department of jurisprudence, which was treated at considerable length. He said:—"I have referred to a few of the legislative measures which the Association has originated, or has endeavoured to promote, but there is a function still more incumbent on it to fulfil, the promotion of a sound public opinion on questions of social and political science. It is matter of daily observation that even our educated classes are in lamentable ignorance on subjects the right understanding of which is essential to the national welfare. When we see public meetings held, and associations formed, to resist the spread of vaccination, and hear people, whose circumstances of light might have given them the opportunity of better information, urge their less instructed fellow-citizens to violate the laws framed to arrest the spread of small-pox and other terrible diseases, one is led to wonder whether there are not minds so framed as to be impervious even to the elementary teachings of science. There is naturally no limit to the fallacies entertained by people who despise investigation into cause and effect, and yet these seem to constitute no inconsiderable part of the whole community. A short time since, for instance, it was announced, truly or otherwise, that the average mortality in certain towns supplied with soft water was higher than in certain other towns supplied with hard; and immediately the conclusion is jumped at that hard water is more healthy than soft. I pronounce no opinion on the question, but it is obvious that the area of facts on which the conclusion is formed is far too narrow to justify such a sweeping induction; and that, moreover there are various other influences, such as soil, climate, occupation, which are just as likely to be answerable for the variations in mortality as the nature of the water supply. A similar logic arrives at the conclusion that if a child has been vaccinated, and has been subsequently ill, the illness is the result of vaccination, and overlooks the vast array of facts which prove the steady declension of small-pox wherever the great discovery of Jenner has been adequately applied; as in Ireland, for example, where at this moment a careful system of vaccination is stamping the disease out of the island. After the same fashion, economical principles of tried and incontestable verity are put aside on the flimsiest pretence. Not long since it was alleged, though never proved—proof being an inconvenience in these cases,—that the trade of the kingdom was falling off, and it was thereupon proclaimed that free trade was a failure, or at any rate that free trade on one side was a mistake, and that we ought to insist on its being reciprocal, or abandon it altogether. In other words, that if other countries are so foolish as to tax themselves with artificial prices on the articles they want, we ought to imitate their folly, and raise the market against ourselves."

Dr. Lyon Playfair's address, as president of the Education Section, was especially excellent, and we would gladly print the whole of it. We must confine ourselves, however, to a very brief quotation. He is speaking of—

Defects in our Educational System.

"The educational principle," he said, "of Continental nations is to link on primary schools to secondary improvement schools. The links are always composed of higher subjects, the three Rs being in all cases the mere basis of instruction. Elementary science, and even some of its applications, are uniformly encouraged and generally enforced. I shall not detain you with examples, as they are to be found in any work treating of Continental schools. But as we have no schools corresponding to the secondary improvement schools for the working classes, we suppose that we can do without the higher subjects used as links. With what result? Our primary schools, on the whole, do not teach higher instruction than a child of eight years of age may learn. In our class of life, our children acquire such knowledge as a beginning; with the working classes, they get it as an end. What an equipment for the battle of life! No armour-plate of knowledge is given to our future artizan, but a mere thin veneer of the three Rs, so thin as to rub off completely in three or four years' wear and tear of life. I am speaking on official record; for we are assured by inspectors that nothing under Standard IV. suffices for permanent use; and yet the Committee of Council tell us that four-fifths of the children, of ages at which they leave school, pass only in lower standards. Recently, under Mr. Corry's minute, inducements have been given for subjects higher than the three Rs, but, for some reason, it pro-

duces scarcely any result. So, under our present system of elementary teaching, no knowledge whatever bearing on the life-work of the people reaches them by our system of State education. The air they breathe, the water they drink, the tools they use, the plants they grow, the mines they excavate, might all be made subjects of surpassing interest and importance to them during their whole life; and yet of these they learn not one fact. Yet we are surprised at the consequences of their ignorance. A thousand men perish yearly in our coal-mines; but no schoolmaster tells the poor miner the nature of the explosive gas which scorches him, or of the after-damp which chokes him. Boilers of steam-engines blow up so continually that a committee of the House of Commons is now engaged in trying to diminish their alarming frequency; but the poor stokers who are scalded to death or blown to pieces are never instructed into the nature and properties of steam. In Great Britain alone more than 100,000 people perish annually, and at least five times as many sicken grievously, out of pure ignorance of the laws of health, which are never imparted to them at school. They have no chance of learning them afterwards, as they possess no secondary schools. The mere tools of education are put into the hands of children during their school time, without any effort being made to teach them how to use the tools for any profitable purpose whatever; so they get rusty or are thrown aside altogether. And we fancy that we have educated the people! Our pauperism, our crime, and the misery which hovers on the brink of both, increase terribly; and our panacea for their cure is teaching the three Rs up to Standard III. The age of miracles has passed by, and our large faith in our little doings will not remove mountains. It is best to be frank. Our low quality of education is impoverishing the land. It is disgracefully behind the age in which we live, and of the civilisation of which we boast; and until we are convinced of that we cannot be roused to the exertions required for its amendment. This is no new complaint, and has been long ago made by far higher authorities than myself." In imitation of our classical schools, Dr. Playfair maintained, verbalism and memory-cramming had grown up as tares and choked the growth of the wheat. Words had taken the place of conceptions. A child could tell you about the geography of the wanderings of the children of Israel, but had no conception whatever of the ordinary phenomena around it. It was hopeless to put to them the commonest scientific questions. Whence comes the water that fills the Thames? What is the origin of hail, snow, rain, or dew? Why does the sun rise in the east, or set in the west? What produces night and day, summer and winter? "In history they could rattle out to you the names and dates of kings and queens, perhaps even the names and ages of all Queen Anne's children as they died in childhood; but, as to a true historical conception, apart from memory cramming of words and dry facts, to be vomited forth upon the examiner, it required a very good school under the old system to find it. Words, instead of ideas, were worshipped. Inspection, under the old system, did something to correct this tendency to verbalism and cram; under the new system they have no time, and, if they had, would find fewer of the higher subjects taught in any way. The teaching of science, if properly done, is the reverse of all this, and will go far to remedy its defects. Books in this case ought only to be accessories, not principals. The pupil must be brought in face of the facts through experiment and demonstration. He should pull the plant to pieces and see how it is constructed. He must vex the electric cylinder till it yields him its sparks. He must apply with his own hand the magnet to the needle. He must see water broken up into its constituent parts, and witness the violence with which its elements unite. Unless he is brought into actual contact with the facts, and taught to observe and bring them into relation with the science evolved from them, it were better that instruction in science should be left alone. For one of the first lessons he must learn from science is not to trust in authority, but to demand proof for each asseveration. All this is true education, for it draws out faculties of observation, connects observed facts with the conceptions deduced from them in the course of ages, gives discipline and courage to thought, and teaches a knowledge of scientific method which will serve a lifetime." All the science which would be necessary to give a boy a taste of the principles involved in his calling, and an incitement to pursue them in his future life, might be given in illustration of other subjects. Instead of mere descriptive geography drearily taught and drearily learned, you might make it illustrative of history, and illustrated by physical geography, which, in the hands of a real master, might be made to embrace most of what we desire to teach.

To the address of the President of the Health Department we will look hereafter: it well deserves attention. On another page reference to the Working Men's meeting and other parts of the proceedings will be seen, and in our next number we may find space to give some additional particulars, and to refer more especially to the progress and condition of Newcastle.

On the evening that the workmen met in the townhall, the ancient castle (Norman in date), was thrown open and lighted, and Dr. Collingwood Bruce, described some of the relics it contains, and exhibited views of

The Roman Wall,

to which he proposed leading a party on the following day. Dr. Bruce knows every stone of the wall and its history, and the excursion had been looked forward to by many in relief of the heavier work: but it turned out no child's play. It involved a considerable amount of walking, some eight miles, and no end of hurry. A correspondent, who was with the party, writes,—"Now eyes were strained to peer into some hole—now directed upward to some hill, and called upon to descry objects north and south at the same time. The indefatigable and enthusiastic antiquary never wearied or rested. The crowd rushed to see what he pointed out, and ran to overtake him. Ladies palpitated over hills, ditches, and stone walls; elderly philosophers perspired in futile endeavours to keep in sight of their ever-darting guide. Now and then he invited ladies to sit down on mounds of slipping stones, or on heaps of gliding planks left by a house-builder by the wayside; but long before they could find a spot of rest everybody had to be up and off again, so that attempts to rest were far more wearying than the unmitigated hurrying. At one moment the doctor was discovered adjusting himself upon uneasy and uncertain stones, from which he steadily discoursed, no one knew how. Next he was perched on a crumbling wall, balancing himself by his wand as Blondin does upon his rope. Had not the learned expounder's story been impartially delivered, he must have fallen over on that side to which his narrative leaned. Once he did fall headlong down a dyke, and was flatly distended on the earth. It was thought we should then have a moment's respite. But, alas! this was not to be. The elastic and resilient antiquary was up again before any one could get up to him, vowing that he could have saved himself but he must have broken his stick, and as he was quite unbreakable himself he preferred the fall." Until the party arrived, crazed and amazed, at the station of Borcovicus, nobody really beheld anything; nevertheless all were satisfied in the long run, and got back to Newcastle safe and happy. They had much less trouble when they went, on Monday, to

Messrs. J. Wigham Richardson & Co.'s Ship Yard,

at Low Walker, to see the launch of a fine iron screw steamer, the *Expresso*, and were entertained most handsomely. The yard of this firm is the oldest on the Tyne. Since the occupation by the new firm, the works have gradually extended, until now they give, on an average, employment to about 800 men, and the average tonnage launched by the firm is 10,000 tons. The vessel—the launch of which the members of the Social Science Congress witnessed—is the largest merchant vessel that has been built in this country for Italian owners. Her length is 308 ft. over all; breadth of beam, 35 ft.; extreme depth, 28 ft. 6 in. As she is intended for the emigrant and mail traffic between Genoa and the river La Plate, in which trade speed is the greatest desideratum, her lines have been designed by Mr. Christie, the managing partner in the building firm, solely with a view to speed. The floor of the cabin is of inlaid work, and the sides of the saloon will be handsomely decorated with views of Italy and South America. An hospital is set apart on the ship for thirty persons, and every convenience for the crew and passengers is provided. As a means to secure greater safety, while at sea, the hull is divided into six water-tight compartments by means of bulkheads, so that an accident in one portion of the vessel will not immediately affect the others.

Replying to the toast of his health, proposed by Mr. John Bowring,

Mr. Wigham Richardson, in the course of a particularly interesting speech, said that the ship being intended principally for passenger service in contradistinction to goods traffic, almost everything had, as in an express train, been subordinated to speed. Her owners were of opinion that by so doing they would always have the preference among intending passengers; and although there was nothing that cost more to attain in a steamer than speed, since if, for example, they wished to gain 50 per cent. in speed, they must burn more than three times as much fuel; still, if they considered that the *Expresso* would have nearly one thousand souls on board of her, it was evident that if the passage could be accomplished in twenty days instead of thirty, the mere saving in provisions would be very considerable. He believed the extent of the emigration from Italy to South America was very little known in England. Probably from 500 to 1,000 emigrants left the port of Genoa alone every week, and one house there (and not by any means the largest emigration agency in that city) received remittances to pay the passage of their relatives of over 100,000 francs per annum. The Italian ships very often have mottoes either on the prow or the stern, or at the entrance to the cabins. This steamer has a line taken from one of the plays of Goldoni:—"Chi non esce dal suo paese vive pieno di prejudizzi," which may be rendered:—"He who never leaves his native shore lives ever full of prejudices."

We could scarcely find a better line to end with.

HEALTH AND SOCIAL PROGRESS.

The working men's meeting, held in Newcastle, as in other towns, by the Social Science Association, passed off very successfully. The fine town-hall, where it took place on Friday evening in last week, was crowded. Mr. Alderman J. Lothian Bell presided, and addresses were delivered by Mr. Rupert Kettle, Mr. Godwin, Dr. Lyon Playfair, Mr. Newmarch, the Dean of Durham, Mr. Robt. Rawlinson, and Dr. Bowring, in the order we have placed their names, the chairman introducing each speaker with a few judicious sentences. We confine ourselves to two of the addresses which refer to matters with which we ordinarily deal.

Mr. Rawlinson, taking as his subject the

Habits of Workmen not long ago,

said:—I suppose I am called upon to address this vast assembly of working men because I can claim the privilege of having sprung from the same stock as the men I see before me; and it was imagined that from my past knowledge and experience I might, in the limited time afforded to me, be enabled to say something of use,—something of advice,—probably something of warning, something of encouragement. I am old enough to remember working men for fifty years. It is fifty years since my acquaintance first began with the working men of this country. I do not know that I am competent at this moment to judge with accuracy of the feelings and the conditions of the vast mass of the working men I see before me, but it may probably both instruct you, and in some respects amuse you, if I tell you what was attempted to be inculcated in my mind when I was a youth of ten years of age. It was, as far as my experience went, the common conversation among working men that the cleverest man was a good drinker and a good "fuddler." All operatives connected with the building trade at that time were connected with drink and degradation. When the foundation-stone was laid, it was celebrated by drinking; when the first floor was put on it was celebrated by drinking; when the roof-tree was reared, there was another bout of drinking. If a workman removed from one place to another, he must pay his footing, and there was a celebration by drinking. Now, I sincerely hope that such customs are of the past, and not of the present. They were of the present in my day and generation, and if practice and precept could have made me a drunken man, I should have been dead long ago of drinking and sottishness. But something in my nature rebelled against it. I do not take credit to myself that I resisted, because I believe that I was constitu-

tionally unfitted to be a drunkard; for if I was tempted into any excess of an evening, I paid the fearful penalty of a sick-headache next morning. You have been told that it is necessary to the prosperity of the working man that he should be educated. I tell you so too. My friend, Professor Lyon Playfair, has described to you the process the State is about to adopt to give to all your children means of a better education, and let me appeal to you as fathers of families, and I am exceedingly sorry that when you came here to-night you did not bring your wives with you, because I think it is just as necessary that the wife should hear all these arguments as it is that the husband should hear them. If every man has to hold his position in the world, and especially to raise himself in the world, he must do it with the assistance of that helpmeet that God has given him. Of what avail will your schools be,—of what avail will all this teaching be, if it stops when the school-door is shut?—if you do not in your own homes follow out that education given to you in the school, and perseveringly strive to make more of it,—if you do not take the talent entrusted to you, and so work it that the five talents shall be ten talents, and that at the end of life the Great Master may say to you,—"Well done, good and faithful servant, enter into thy reward." Every working man's home, as Mr. Godwin has told you, should be so improved that it should be his comfortable residence—his castle, and in time of sickness his hospital. I do not think it a creditable state of things that charity should so supplement that condition of the working man that when sickness overtakes him he is necessarily put with an aggregation of human beings in the same state of misery. When civilisation has fulfilled its mission, and when statesmen have learned the full lesson of their duty, and when Governments so regulate and so order the laws, I hope that if we do not see it our children or children's children will see it—that every man can have a roof over him; can have room-space about him and comforts within himself; he shall not need to go externally either to the dramshop or the beershop to get out of the court in which he has to dwell, or on washing days to get rid of the smell of the soap-suds, to spend his earnings selfishly and improperly in debasing himself, degrading his wife, and beggaring his children. The great Lord Brougham, whom I have had the pleasure on several occasions of seeing in the place of your chairman at this great meeting, and who, so long as life was spared him, never missed an opportunity in connexion with this institution, which he founded, of presiding over such meetings as this—Lord Brougham compared society to the Egyptian pyramid, that emblem of stability. The lower courses, the great masses of the people; the intermediate course, rising up to the apex; the intermediate grades of society, crowned by the king or president, as the case may be. Now, it is quite clear that the stability of the pyramid, in spite of its form, would be nothing if the lower courses were not sound and stable; and society most certainly at the present time and in this country, and, as far as I have studied the question in other countries, is not in that stable position, because the welfare of the working man has up to this time, from the first beginning of history, been grossly neglected. It must be that men will begin to wish for that stability, for there is no state in which society can be safe and stable if the foundation be not sound, good, pure, and true. In a remarkable speech made by that great statesman, philanthropist, and speaker, John Bright, at Birmingham, he used this faithful and remarkable simile: he said that when the Atlantic telegraph was lost in mid-ocean, and when it was thought to be hopelessly lost, the iron grappling hand of science was lowered more than 2,000 fathoms deep—where the pressure was 5,000 lb. to the square inch—that it successfully grappled the cable and brought up the line of communication which bound the two worlds in one; and he said he thought it was time to consider if the human hand of statesmanship could not be lowered down to the depths of our civil degradation to grapple with the amount of misery and destitution that pervaded society. I sincerely hope, he said, these meetings will enable us to come to right conclusions, and enable us to advise the Legislature to enact wise laws, and any little teachings laid before you will send you home so—for that is the bottom of it all—that you individually, each man for himself, shall study the question, and strive how much better he can make himself, how much more comfortable he can make his home, and how much happier he can make his wife and children.

Mr. Godwin took for his subject,

Health and Home,

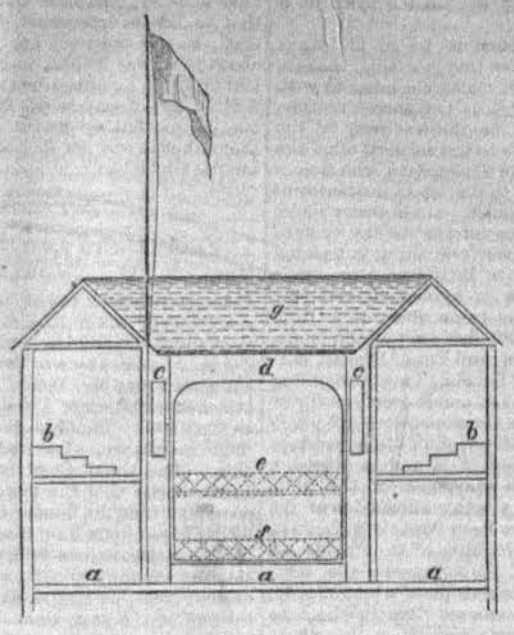
and at the starting begged his audience to receive any words that might drop from him, and which might be less agreeable probably than the words they had heard from Mr. Rupert Kettle, in the same kindly spirit as that which prompted them. He said*:—You know very well that one of the departments of the Association is devoted to the improvement of public health,—to such questions as properly constructed houses, good sanitary laws, recreation grounds, and other matters that conduce to the general welfare and the general happiness. On all similar occasions this subject has been entrusted to one of the speakers, and I feel it a compliment that I am here allowed to say half a dozen words to you upon it. I have given attention to sanitary matters in one way or another for many years, and if I should offer any objection to what I have seen in your town, it will be done without any intention whatever of giving offence. There still exists very great ignorance in the matter of public health—an ignorance, I might say, in all classes, though, for my own part, I can scarcely recognise classes,—in England, classes all run one into another,—I say there is great ignorance in the community upon this matter. They fancy, for example, that they know all about air. If you begin to talk on the subject to a body of men, such as I see here, they say, "Oh, we know all about that;" but, unhappily, the great majority of them act as if they knew nothing about it. The poet writes of "trifles light as air," but air itself is no trifle, that is quite certain. If you could but estimate the amount of mischief done by this ignorance of air, it would be so stupendous that it would astound you. Some persons have a notion that the only means of comfort is to shut up every hole in a room, and prevent the access of air. It is God Almighty's arrangement to give an unlimited quantity of pure air, and it seems to be man's arrangement to endeavour to limit that supply, and to deteriorate its purity in every way in his power. I have often mentioned the observation of an old clergyman who used to complain greatly of his flock for shutting out the air: he said, "If I were to preach in a barrel, they would stop up the bunghole." That is just what the majority of us do. I have been in houses—I have been in some to-day—where, for example, the top sash is nailed up—a suicidal act—doing such damage as one could scarcely tell of in the ten minutes that have been allotted to me. Now, people will not drink dirty water,—not willingly, though sometimes they are obliged, even in Newcastle,—but they have no objection whatever to take in dirty air. If they would but remember that from dirt comes death; if they would but realise the absurdity of the saying that "own dirt is no dirt;" if they would but see the absurdity, the dangerous absurdity of that saying,—I am sure they would act very differently. From our own breath may come our own death. It has been shown pretty conclusively that about 700 cubic feet,—say, 10 ft. by 10 ft., and 7 ft. high, and we can all imagine a room of that sort,—is about as small as a single individual should inhabit. I have been in houses in this town where six people were sleeping in that same space; and, therefore, having 120 cubic feet, or something of that sort each, instead of 700. Many of these evils come from want of thought, and they might be guarded against even by the people themselves, although I must confess that men are often placed in great difficulties. The increase of population in Newcastle, for example, has been much greater relatively than the increase of houses, and overcrowding, which means all sorts of dangers, all sorts of miseries, crime and death, is still prevailing in many parts of Newcastle to a very great extent. I knew a bed in a hospital where every patient died who was put into it; I knew a stable in which no horse would live beyond a certain number of months; I know houses in London where successive families are stricken down by fever as they go in, all of which might be prevented by a little knowledge. I ventured at a meeting yesterday to speak of the sewers of Newcastle (I am obliged to run from one question to another because of the short time allowed); and I am afraid that I a little annoyed some of the excellent authorities of your town. I do not venture to complain in the least of anything they have done; I simply say that a vast deal yet needs doing in Newcastle. I believe that for some time past a great deal has been done by your excellent town surveyor, Mr. Fulton, and by the corporation; but if any member of that corporation thinks that this town is well sewered, that it is well provided with water, that proper arrangements have been made for the education and recreation of the children, then he is labouring under a great mistake, and it appears to me that the corporation ought to be obliged to any stranger who, with a fresh eye, shall tell them what seems wanting. Now, if I were not afraid—I am almost afraid, but if I were not, I would tell of two or three things that I saw yesterday afternoon in this town. I have walked through some of the chares and some of the courts of Newcastle, and I must confess that in many of them there exist things of which I thoroughly believe those who think I am too critical cannot be aware. For example, I went into Rosemary-court, I believe it is called, and I found that there were seventeen houses dependent upon one miserable wretched hole for convenience. A poor woman, well dressed, and of most respectable appearance for her position, lamented to me the condition under which they lived, and her description of it was truly painful. I might dilate upon it—I might speak of courts leading out of Market-street, and others quite close to the townhall, and to the best parts of the town, all of which require supervision when it can be obtained. I do not say it can all be done at once. I know it cannot be; but let it be remembered that it is needed; let it be remembered especially that you do want a proper outlet for your sewage. But, if possible, the sewage should not be wasted but applied to the land, where it would be productive; we should put back to the earth that which we are plainly taking from it. The badness of parts of your town can be easily made quite evident. If you happen to live in St. Andrew's, for instance, you have a fourth chance more of life than you have if you live in All Saints',—that is to say, for every twenty-nine persons who die in All Saints', there are only about twenty-four persons who die in St. Andrew's. Now, say that five persons additional in a thousand die because of bad arrangements,—and I should say that a great many were dying even in St. Andrew's from bad arrangements; but take the worst as compared with the best, and what does the death of five persons in 1,000 in this town (a town of 130,000 inhabitants) imply? It means the unnecessary death within the year of 650 persons. Points of this sort, if got into the mind, will show the necessity and value of sanitary movements and improvements, the provision of fresh air, good water, and pure food. And, touching food, if you were to hang two or three tradesmen who adulterate it, no wrong would be done. I would do it without scruple. There are a number of other things upon which I should be glad to touch if time permitted. There are those houses which are built back to back. I have been in a hundred of them to-day. This state of things cannot be helped at present, I know, but in Heaven's name get rid of them as soon as you can. It is impossible to be lively, or healthy, or happy in a house without an opening at the back, without water, and with four times the number of people living in it that ought to be there; indeed, under such a state of things it is scarcely possible to be virtuous. I had a sore throat simply through passing for a couple of hours through these places, which produce on the inhabitants a depression of spirits, and a general degradation of health, which leave them no power of doing good, and no power of exertion. Just compare the condition of a man in a healthy house, with a happy wife, and that of a man living in a house of a different sort, having bad air, bad smells, and necessarily a grumbling wife, a wife that cannot be clean, even if she would. Positively there were many houses I saw which could be called little better than charnel houses. I know the corporation go on gradually improving in these matters, and they want and must have your co-operation, because, for effecting the objects desired, it is necessary to make rates, and in this way they must have great co-operation, and that not only in the aggregate, but individually. In your own houses, very much can be done if you get knowledge on these sanitary points. I saw an enormous number of courts unpaved to-day; get these places paved, for an immense deal of good may be done even by paving. It is a serious thing to have these courts unpaved; it does not merely mean uncom-

* We adopt the report given in the *Newcastle Chronicle*.

fortable walking, but bad air, decomposition, and, in fact, everything that is bad. Such matters may be considered small things in themselves, but they touch upon the happiness and prosperity of families, and these are by no means small things, and therefore perhaps you will pardon me for the ten minutes I have occupied in pressing upon you the great importance of sanitary knowledge and sanitary improvements.*

SHAKSPEARE'S GLOBE PLAYHOUSE AND OUR GAFFS.

Curious enough how, says Mr. Carlyle, as it were by mere accident, this man, William Shakspeare, came to us. Curious, indeed, it was,—one might almost say miraculous,—considering from out of what a dingy, dismal place, and through what a narrow, dirty court, he did emerge into the light of day. Before we venture to describe the "Globe" Theatre, it will be necessary to say a word or two about the "Blackfriars,"—quite as curious a subject, by the way, as the Globe itself,—perhaps even more so, as it was to the Blackfriars that Shakspeare first made application for dramatic work. The Blackfriars Theatre was not a regularly built and designed theatre, but simply a common two-story house converted into a theatre by a little pulling down, and alteration, and tinkering. Mr. Knight cannot quite make it out; but the whole affair was simple enough. The partition between the front and back parlours was taken down, as also the partition above, the floor over the back room removed, and partially from over the front room as well, so that the whole space from the lower floor to the ceiling of the room above was clear. This floor, in part being raised 2 ft. or 3 ft., constituted the stage, the rest of the space being the pit, or space for the "groundlings," as the pit audience was termed in Shakspeare's time. The portion of the floor of the front upper room made the gallery. This was the famous Blackfriars Theatre. An ordinary private house with the floor between the two stories pulled down made a "playhouse." In the Lower Marsh, Lambeth, there was, and is, a small theatre constructed almost timber for timber in this temporary sort of way. It once gloried in being a gaff, but is now a chapel, and some of the scenery yet remains to remind those who visit it of its former vocation. A very considerable effort of the imagination, says Mr. Knight, and some knowledge of minute facts would be necessary to form an accurate notion of that building in the Blackfriars in which we may conclude the first plays of Shakspeare were exhibited. Not so; for the fact is that in this very ruin of a playhouse may be seen almost a *fac-simile* of the playhouse in the Blackfriars, in which Shakspeare acted and wrote. Few are likely to visit, or have ever visited, this place; but there is another, in a somewhat different quarter of the world, and filled with another audience, which will realise to a certain extent the Blackfriars to any who feel curious enough about it. We refer to the room or "dormitory" of the Westminster School in which is annually performed the Westminster Play at Christmas time. This is merely a long room fitted up with a temporary stage and gallery, the pit being the floor of it, and would doubtless have seemed to Shakspeare and his company quite a magnificent place; indeed, we may be quite sure that Shakspeare's imagination,



vast as it was, could never have reached it. So much for the Blackfriars, on which a good deal more might be said, for there are two or three places in the outer parts of London which might bring it vividly before the mind's eye, but our present business is more especially with the famous "Globe."

The Blackfriars Theatre, as we have seen, was a common "private house" converted into a theatre in a temporary and somewhat rough way; but the Globe Playhouse was a regularly designed and constructed theatre,—a place in every way, as things then were, adapted to its purpose, and we may feel quite sure that the building, whatever we may now think of it, was fully equal to all that was required of it. Nothing, surely, was ever more singular; for how in such a place a full five-act play of Shakspeare's *could* have been performed, may remain a mystery, or the theme for a German theory. We have given a *section* of the Globe Theatre, drawn from a careful consideration of all we could collect bearing upon it. There is not much, truly, but still enough to make one pretty nearly certain of its general accuracy, and any professional reader can, from the section, readily realise to himself the general aspect of the building outside as well as inside. The Globe was built in 1594. It was, as will be seen, open to the weather; in architectural and classical language, this temple of the Muses was *hypæthral*, the gallery (*b*, *b*) was covered, but not the pit (*a*), or space for the "groundlings." The stage could have been but partially covered. It was octagonal on plan, at least outside, as the old print of it shows; but inside we are inclined to think that it was circular. The pit seems to have been level, as it is to this hour in two of the gaffs, with probably low narrow benches without backs, for the accommodation of the "penny" audience. The stage was raised, as will be seen, about 2 ft. 6 in. or 3 ft. above the general level of the pit, and had in front of it a low railing, probably something similar to the footlight railing in an ordinary theatre. The gallery ran round the building, stopping at the private boxes (*d*, *d*), of which there were two next the stage, very small ones, and specially reserved for special visitors to the house. There is no evidence to show that there was any second gallery; so that there is but one gaff even now existing in London that can be instanced to afford an idea of the *size* and *arrangements* of this little, inconvenient, weather-beaten playhouse of Shakspeare's. The Alhambra, Shoreditch, a penny house, though not a pure gaff, shows, in a luxurious way, what the Globe was like, and may be nearly the size of it, but not quite fairly representative, inasmuch as it is covered in. In size it must have been from 25 ft. to 30 ft. across, from the one side of the gallery to the other. There were *no scenes* of any kind, or slips, or even a curtain, as some think, or, indeed, any of the appliances of a modern theatre, even of the smallest kind. The modern "gaff" would have electrified poor Shakspeare, and in the "Bower," a gaff, he would have thought himself more than a manager. The only place in London nowadays in which one *scene* does the work of the whole play is in the Westminster Dormitory before named, where a pleasantly-painted view of the Athenian Acropolis, though the plays are always Roman ones, does duty for all times and circumstances; but in Shakspeare's day there was not even this, but at the back of the stage, at about 7 ft. from the ground, there was a small gallery (*e*), from which, as it would appear, the principal speeches were delivered. Any change of time and place was indicated on the stage by the bringing in of some piece of stage furniture or other indicative of it. Thus a bedroom scene was shown by the presence of a small couch, a living-room by a chair and table, a garden by a flower-pot or two, and so on. A little of this kind of realism yet lingers in the gaffs, the scenery not having quite banished it. It is well to mention that some of the audience sat on chairs placed on the stage, and that the musicians also sat or stood there, there being no space put aside for an orchestra. All the floor of the stage being thus occupied, but small space could have remained for the performers, and we can well imagine how inconvenient and crowded it must have been, and how *few* players could have been on the stage at one time; and this may, perhaps, in part account for the little gallery at the back of it, for sometimes it must have been most desirable to show the "whole strength of the company," small as it was, and some of them doubtless mounted into this gallery to show themselves.

In one of the most characteristic of the modern London gaffs, unfortunately burnt down but a year or so ago, a very small place in the dismal regions of the far East, a thought or two from before Shakspeare's day might be seen and recorded; for the "supers" were children, as they often were, for the children of the Chapel Royal, and St. Paul's, and Westminster, before the enlightenment vouchsafed to their modern successors, acted plays and interludes even before Majesty itself. These youthful performers in this place filed on to the stage, danced a few steps, then remained at the back, "all in a row," through the whole performance of the player or singer who might happen to be going through a character of his own, but without any reference to them, till, it being over, these supers danced a few more steps, and then filed off again. It was some such work as this that our immortal bard went through, whether on gallery or ground, when he first ventured on the perilous sea of London dramatic life; and he might have comforted himself, had he known it, by a recollection of the fact, that, as far back as the time of the old Normans, in the twelfth century, Abbot Geoffrey, of the abbey of Dunstable, had a play acted by children pretty much, as we may suppose, in this strange way. It may seem to many rather dull, on paper, but it is not so in reality,—indeed, it is a very pretty idea; and one cannot help wondering, as we get to know the place he had got to, whether our immortal poet repented or no of having "run

* Commenting on these observations, the *Newcastle Chronicle*, in an able leading article, says,—"At the working men's meeting, held under the auspices of the Social Science Association, in the Town-hall, Mr. Godwin drew attention to the absolute want in many districts of Newcastle of good sewers, good water, good houses, and good recreation ground, or the ordinary conveniences of civilisation. In one spot, "Rosemary Court," Mr. Godwin found seventeen houses dependent upon one wretched hole for convenience. Facts like these sufficiently account not only for a high death-rate, but for aggravated immorality. Where decency, ordinary decency, cannot be maintained, the graces of virtue are impressed. It is the habit to assume this state of things is inevitable. There could not possibly be a grosser delusion. A good house is the ambition of even the humblest of our countrymen, and when Englishmen herd together in such hovels as Mr. Godwin so graphically described, it is only under the compulsion of supreme necessity. It is confessedly difficult to make small houses pay, and in that difficulty we have an explanation of the lack of comfort to which the least fortunate section of the community is compelled to submit. But this obstacle is not insurmountable. Where competent architectural skill is brought into play, it is perfectly possible to secure a fair percentage upon the erection of workmen's houses. With that fact demonstrated, we may expect that the dens of Newcastle, which Mr. Godwin denounced, will quickly disappear. While they exist we cannot hope for even comparative immunity from either disease, immorality, or crime."

away from his master to London town as a serviture."

It is obviously impossible to go at length into all the little almost inappreciable, though, put together, important matters connected with this most curious subject; but surely no time and painstaking could be thrown away in the attempt to bring home to the modern mind the *surroundings* of the man Shakspeare, who from a very mean rank, rose to the top of his performance, the *Ghost* in "Hamlet," not in Drury Lane, but the Globe—a place inferior to any modern gaff. There is, however, one thing connected with the building not to be passed over,—it is the curious indenture or agreement and part specification which has come down to us from the year of grace 1599, between Philip Henslowe and Edward Allen, and Peter Streete, carpenter and carver, of London, for the building of the Fortune Playhouse, and it seems to throw light on the Globe, for the dimensions are given and a sort of general description of the work to be done in the building of it, and is, indeed, a rough description of a playhouse of the time, and has helped us to a better knowledge of the Globe than would have been possible without it. The contractors are required "to provide all manner of workmen, timber, joists, tile, lath, boards, doors, bolts, hinges, glass, workmanship, and other things whatsoever therein shall be needful." With documents such as this Shakspeare must have been well acquainted and perfectly familiar; for, though not a manager, there can be no doubt that he was a "property-man" and stage-manager, both from the very necessities of the case, as we see it when well acquainted with the Globe building, as from the recorded fact, which even Mr. Knight does not deny, that he bought and sold, and let out theatrical dresses, and really did quite a little brisk trade in the providing and loaning out to —shall we say it?—needy actors and "supers" such necessary costume as they could not afford to buy. Thus wonderful as it seems at first sight, till you come to see into the ways of the Globe Theatre, its actors and its audience, to find this man William Shakspeare, the dramatic poet of nature, and of all time, mixed up with all these little trifling and trading matters, picking up a few pounds or shillings in any way he could, and through every source that presented itself; for no one ever seems to have felt the truth of the words, "if money go before, all ways do lie open," more keenly than he, and which, considering his drear and dark apprenticeship to the trade of getting it, it is no wonder he did feel.

It is important to remind the reader that the main idea for the arrangement of a playhouse came from the custom of using *inn yards* for the representation of plays, and which were, of course, open to the air, with a gallery or galleries round three sides of them. On the *ground* of such an inn the players and the audience alike stood; the better sort sat in the gallery above; so that a playhouse was simply as far as possible a copy of this very simple arrangement. In the yet remaining old-fashioned inn of the "Four Swans," Norton Folgate, Shoreditch; and one other, perhaps still better as having but *one* gallery, a small half-ruinous inn, opposite Christ Church, Mile-end, may be seen a possible theatre of this kind, though improvements are making havoc with it in more ways than one, the galleries having been all glazed. The Globe was little more than a copy of one of these inns; but octagonal on plan, with a raised stage, it did not even occur to the builder to cover it in. Lights were burnt by day during the performance, not foot-lights, but bracket lamps, one or more on each side of the stage. Time was when the pit of a theatre was the cheapest part of the house, as it must have been in the Globe, and is now in some of the gaffs which do not boast of a *second* gallery; for where this exists the "groundlings" are promoted to higher seats, and the gallery holds *the* audience. This is the arrangement in the "Bower" Theatre, the "sustained splendour" of the neighbourhood occupying the middle or "dress-circle," on a level with the private boxes. The pit thus becomes more select and somewhat safer for those who feel a little timid. All these things are the material arrangements of the "gaffs," and were precisely those of the Globe gaff in which Shakspeare played and strutted his brief hour, and did all his magical and world-famous work. "He could have ruled empires," says Emerson, in a burst of hero-worshipping enthusiasm; "I feel that he could." He might have done so; but it is quite sure and certain that he did not rule, much less create, a Penny Gaff; he did not even act in it, but he moved about in it, was helpful to every one in it, and, last of all, in an altogether unconscious and unnoticed sort of way, wrote for it, and lent to each one of his fellows brains as they could take them; but it was not for the *world* he wrote, but for the Globe Gaff!

ARCHITECTS AND THE BOARD OF WORKS.

An inestimable friend, who religiously reads every line of the *Builder* chiefly for the purpose of finding something misstated or forgotten, wants to know why we, like other journals, have not stated that Mr. James Pennethorne, late an attached architect of the Board of Works, is to be Knighted. Simply because the assertion is a little premature. The real state of the case is this. The Chief Commissioner informed Mr. Pennethorne that the Prime Minister would recommend that the honour of Knighthood should be conferred upon him, if agreeable to him; and Mr. Pennethorne, we believe, replied that, considering the circumstances under which he quitted office, he should like it: so probably at the end of the year, when the Queen returns to Windsor, the well-deserved honour will be conferred. Inasmuch as we ourselves suggested, on the completion of the London University Buildings, that such an evidence of Her Majesty's consideration would be highly esteemed by the profession, it must be unnecessary for us to say that no one will more heartily hail our esteemed colleague and friend *Sir* James Pennethorne, when the time comes, than we shall.

Mr. Pennethorne's business at the Office of Works will go into several hands, but the Office of Woods' business is now referred, and probably will so continue, to Mr. Arthur Cates; but without an appointment, which for him is just as good in a pecuniary point of view.

We have lately glanced hastily at a printed paper,—whether a draft and merely at present for consideration, we do not know,—containing a scheme as to the duties and remuneration of architects employed on public works, drawn up by the Government Board of Works. It is very precise and stringent, but on the whole did not seem unfair, except that it reserves to the Government the nomination of an arbitrator if differences arise. The percentage is left open: but one-third of the remuneration is to be paid when the builder's contract is decided; one-third at a second stage; and one-third when the builder is paid his balance. Would it not be well for the Government to submit it to the Institute of Architects before it finally adopts it? There ought to be two parties to such a document, to prevent chafings and soreness, and in some, perhaps, a sense of unfairness. The profession as a body consists of fair and honourable men, and would feel disposed to consider such a document in a candid spirit. This would save future difficulties and misunderstandings.

COLOUR IN MODERN STAINED GLASS.

Continuing my observations, it is asserted that stained glass, which we have learnt "to make and use in the skilful manner which the old architects did," and which we now apply with "excellent effect," was only part of the ancient system of coloured decoration, and necessitates the application of colour to the entire structure.

Passing by the unproved assertion that the architects of those days were the designers of the stained glass of their time, as well as of the coloured decoration of their buildings—which was disposed of in my last letter—I would ask whether, even if they were, we are called upon, because their buildings and their mason's work deservedly rank amongst the highest efforts of architectural art, to accept with a slavish and undiscriminating admiration whatever else they did. We know well that, although their mouldings and conventional foliage were of the most effective and exquisite character, they were utterly unable, down to the middle of the thirteenth century, to draw or to carve correctly the human figure; and if we reject as utterly unworthy of our consideration the irrational demand which would require us to adopt these quaint but ignorant attempts of Mediæval artists to represent the human form as the models we are to follow in the sculpture of the present day, surely we are equally at liberty to consider whether their use of colour in windows and on walls is, or is not, in accordance with the rules of good taste and high art, as we now understand it, and worthy or not of our adoption and imitation.

It may be said, it is true, that this matter may be supposed to have been settled for us long ago; that we have for many years past been designing and executing windows after the fashion of those of the Middle Ages; and that it is rather late at the present moment to raise this preliminary question. On the other hand, it is, perhaps, at the present moment, when we are called upon to extend this coloured decoration in our church restorations, from the windows to the walls, that it especially behoves us to consider well what we are about to do; to review dispassionately what we have already done; and to examine well whether the results of the exercise of this new art, if art it be, are really and undeniably as "excellent" as they have been declared to be.

Permit me to assist those who may desire to enter on such an examination, by describing a stained-glass window,—one out of five or six large windows in a church which I have lately seen,—which, recently issuing from the workshop of one of the most distinguished manufacturers of stained glass, may be taken to be a fair type of the more costly stained-glass windows of the present day. The subject is the Crucifixion. The central figure is, of course, that of our Saviour on the cross. His loins are girt with a cloth of ultra-marine blue, having a rose-coloured lining. On the left stands the blessed Virgin, clad in what appears to be a green baize wrapper, lined with salmon-coloured taffeta, and an under-garment of bright vermilion, adorned with gold-embroidered collar, cuffs, and border. At the foot of the cross is St. Mary Magdalene, clad in a Prussian-blue upper garment and pea-green robe. She wears a collar of apparently silver filagree work round her neck. On the right stands St. John, in raiment of three colours,—scarlet, blue, and green. Next to him is seen St. Mark, in a diapered amber-coloured vesture, over which is thrown a green cloak or toga, lined with violet; and on the opposite side is St. Luke, in equally brilliant garments. To describe the whole of the other figures in the picture—in all sixteen—would be tedious; suffice it to say, that they share among them the whole of the six primary and secondary colours of the prismatic spectrum, contrasted and combined pretty much in the manner already described.*

It is impossible for a moment to be blind to the fact that the object of the designer of this window, in which the most portentous event in sacred history is unintentionally converted into a harlequinade, has been, not to present a truthful picture of the Crucifixion, but to seek, in the clothing of the divine and saintly personages that are introduced, a field for the lavish display of the gaudiest colours of the glass-stainers' workshop.

The toleration by a reverent and sober-minded community of so startling, so unnatural, and so untruthful a picture, in so prominent a position as the east window of a parish church, is at first sight almost incredible. And if this were the first window of the kind that had ever been seen, there can be no doubt what its fate would be. The facility, however, with which we become first habituated, then reconciled, and ultimately attached to what is at first sight startling and repugnant to our feelings, is, in matters of art, as well as in matters of religion, one of the most dangerous weaknesses of our nature. Use, ancient example, a certain supposed conventionalism in matters of this kind, and, above all, modern imitation, growing first into a habit, and then into an unreasoning and imperious fashion, have combined to blind us to the manifest vulgarity of this growing fondness for gaudy colour, the effect of which on ordinary minds is best conveyed by the expression of a small tradesman, who, on beholding the sacred scene portrayed in the picture I have above described, when the window was first erected, declared it to be "gorjus!"

It is true that there are numerous incidents of Bible history, in the representation of which this redundancy of strong colour would not be so glaringly offensive as in the instance I have

* This design, which as regards its colours resembles those of the other four or five windows by different artists of high repute in the same church, will be recognised as similar in its main features to hundreds of others representing the same subject in different parts of the country.

referred to; but in by far the greater number of the stained-glass windows of the present day, whatever be the subject treated, whether the personages introduced be Magi or Martyrs, Soldiers or Saints, Kings or Beggars, their dress is the same; the obvious aim of the design being to produce a dazzling effect on the mind of the beholder, by means of large patches of gaudily-coloured stained glass, not produced by the brush of the artist himself, but manufactured and sold to him by the ordinary glass-stainer, at so much per square foot.

It remains to be considered whether, renouncing such extravagance, we may yet be able, in the matter of stained glass, to extract from ancient precedent and modern practice a system of decoration which, without offending our common sense, or our good taste, may yet fitly represent at once the dignity and the purity of English worship, as well as the warmth of devotion inseparable from the true profession of the Christian faith.

There is no doubt that, as I have already remarked, the lavish display of deeply-stained glass in large patches is the most glaring defect of modern work. There is a preliminary objection to the use of these deep colours in large quantities, arising from the positive obstruction to the passage of light. There are portions of the clearstory windows of the noble work of Bishop Hugh in Lincoln Cathedral, the details of which have been thrown into such complete obscurity by the introduction of deeply-coloured glass in the windows of the opposite clearstory, that it is impossible, except at a certain hour of one of those bright summer days that are so rare in this climate, to detect their form and outline, still less to appreciate the grace and vigour of their treatment. In buildings containing lancet windows, nothing short of absolute prohibition of the use of these deep colours will be effectual. But even in buildings where, as is usually the case in the Rectilinear Period, the windows are large and numerous, the chief characteristic of glass,—transparency,—and the object of its use should never be overlooked, nor the material itself denaturalised; and if the sums that are spent over the purchase of so many square feet of deeply-coloured and almost opaque stained glass for a single window or two were employed in the conversion of the whole of the plain windows of a church into stained-glass windows of more transparent character, of less cost, and of becoming and graceful design, the gain would be great, not only to the worshipper and the lover of architecture, but, in my opinion, also to the glass-stainer himself, whose business might thereby be largely and profitably increased.

It is not difficult to foresee, if the present fashion be maintained, and the whole of the windows of a church, in which one or two such memorial windows have been inserted, be filled with stained glass of similar depth of hue, that all traces of the architecture of the building will be lost in a Cymmerian gloom,—unless, indeed, the worship be conducted by gaslight,—and that sooner or later, when the inartistic nature of these gaudy pictures and grotesquely-dressed figures begins to be recognised, a wholesale removal of these opaque transparencies will take place. Nor can there, I think, be any doubt, as the fashion becomes old, and new and better ideas prevail, what the verdict of posterity will be on these art-works of the nineteenth century.

Before, however, we can hope for improvement, we must not only know what to avoid, but what to select and adopt,—a task compared to which the former is an easy one. Without having the presumption to offer myself as a guide in this search, I will venture to suggest a direction in which we may possibly seek with advantage for that assistance of which we are in need,—one, at all events, in which we may work with safety, if not, indeed, with good effect.

Before doing so, however, I will mention a circumstance which has often struck me, and which must have been noticed by others. The treatment of some of the most effective old windows that I know is, in their present state, the result of accident, and not of design. I refer to those which have been formed of fragments of stained glass, collected from many windows, and formed into one. The effect produced is that of mosaic, in which the groundwork, formed of the lighter portions of old glass, mixed with dulled white modern glass, gives a gem-like richness to the smaller portions of deep blue and ruby glass to which they form the setting. Such a window, the agreeable brilliancy of which cannot fail to strike the observer, is to be seen in the clearstory of the apse of Peterborough Cathedral. Many others will, doubtless, occur to those who interest themselves in this question. To this may be added the fact that some of incomparably the finest windows that are left to us of early times are designed precisely on the same principle,—that, namely, of giving effect and apparent value to small portions of richly-coloured glass, occurring in coats of arms and similar devices, by the predominance, as a general ground, of larger portions of amber, grey, light brown, and light green glass. The Church of Etchingham, in Sussex, has remains of stained glass in all its beautiful curvilinear windows, designed, if my memory does not deceive me, on this principle, and coeval with the church.

Edmund Sharpe.

THE UTILISATION OF SEWAGE.

From amongst the papers on this subject, read at the Newcastle Congress of the Social Science Association, we select for publication that by Mr. James Blackburn, of the Aldershott Camp Farm, as it sets forth the result of many years' actual experience there and in Scotland. Mr. Blackburn said the question is, "What is the best method of disposing of sewage and excreta?":—In considering this I will not detain you by dwelling on the old ash-pit system of collection, which necessitated the removal of the same by horse and cart. This plan has been condemned long since on sanitary grounds, and has been found practically to involve a great waste of manure. There are, however, a few plans based on the dry system of collection, of which Moule's earth-closet has attracted the most attention; that also known as Evur's is similar in principle, inasmuch as both use a dry material for absorbing the refuse which is afterwards used as manure; but these do not deal with other waste liquid matters, for which a system of sewers would have to be provided, and their contents treated some way or other at the outfall. I think it may be presumed that water has long been decided on by sanitarians as providing the best means of bearing away all the refuse of our towns, which will have to be taken on to the land in some form or other. Filtration, chemical treatment, and irrigation have been tried with a view of accomplishing this. By filtration the solid and suspended matters are easily separated; the same is done more perfectly by chemical treatment, lime or alum forming the chief ingredients by which precipitation of the suspended matters is brought about. That known as the lime process has been used at Leicester, Tottenham, Aldershott Camp, &c., but has been abandoned. Compounds containing alum have been tried at Northampton, Stroud, and other places; also by the A B C Company at Leamington and Hastings; but it has been found, on careful investigation by the Rivers Commission, that they fail in removing the matters in solution, while the dry manure is of very inferior quality. Irrigation, which implies taking the sewage straight from the outfall to the land, holds out great hopes of success, both as regards utilising the manure and preventing the pollution of our rivers; to do this with the least waste and offensiveness, the sewage should be delivered on to, and absorbed by, the soil in a fresh state before decomposition has commenced. The waste of this manure has been enormous, and must have correspondingly lessened the food-producing power of the country, and it really appears if we could have gone on pouring everything into our rivers with impunity, we should have done so to all eternity; but this evil may now be said to be gradually working its own cure. There is only one outlet for the world's refuse, and that is vegetable production. No filter nor chemical or mechanical contrivance can compete with the soil as a medium for purification; it abstracts not only the suspended matters, but also those in solution, then retaining them until appropriated by the plant, and this cleansing power is ever being renewed by the plants, which are constantly withdrawing the deposited impurities and rebuilding them into vegetable structures. Water, besides having a value of its own, is an economical carrier, and efficient distributer of manure, which in sewage is in a very fine state of division; it insures such a complete admixture with the soil as cannot be arrived at by any other means, and the efficacy of all manure depends to a great extent on its uniform diffusion. The water-supply of towns varies from 50 to 15 gallons per head per day, and in many instances the sewers receive a large addition of subsoil drainage: this is a serious drawback on heavy soils, and also in those cases where pumping has to be resorted to. My agricultural experience in the use of sewage leads me to prefer a supply of 25 gallons a head as the best measure of dilution, bearing in mind that it has to be applied through all seasons of the year; the less storm water that finds its way into the sewers the better, as the matters it may bring down are comparatively worthless. The amount of sewage that can be advantageously used on land depends a good deal on how near it approaches in texture to a sand or a clay, the former through the season requiring more than the latter, but taking an average medium soil, from 60 to 70 head of population per acre per annum may be necessary, so that a farm of from 100 to 120 acres will profitably consume the sewage of a town of 6,000 or 7,000 inhabitants, amounting to 700 or 800 tons a-day; but in sewage farming, more even than in ordinary agriculture, a maximum return from a given area is what should be aimed at, as the great means of reducing the heavy fixed charges, many of which remain constant, irrespective of the produce. The land, unless resting on a porous stratum, will have to be deeply drained, and all irregularities in the surface which may interfere with the conducting of the sewage removed. Deep ploughing and subsoiling are then necessary, moving and aërating the ground to a depth of from 1 ft. 6 in. to 2 ft. The better the quality of the land the less sewage it will require. The difference between good and bad land is never adequately represented by the difference in rent, especially in the case of sewage farming, where the quality of the soil tells not only on one crop in the year, but on four or five in the same time. The sewage at the delivery on the farm must be rid of its solid matter, and as much of that in suspension as possible, as the clearer it can be applied, especially to grass, the better. The solid matter thus separated I have found to be a very poor manure. In this state it may be conveyed over the farm by open or covered main carriers and further distributed on the land from small open channels, which, according to the configuration of the ground, will either be arranged on the catchwater system, or, when very flat, an artificial slope must be obtained by ploughing into ridge and furrow. The cost of levelling and laying out the land will vary from 10l. to 20l. an acre. Italian rye grass and green crops of all descriptions are the most successful to cultivate; the former is first-rate food for cows, and also for horses, at a later period of its growth when cut and consumed in the house. From fifty to seventy tons may be raised per acre through the season. Rhubarb, onions, French beans, and lettuces thrive luxuriantly under proper treatment. In winter the deeply-ploughed land and grass will take the sewage and retain its manurial matter until the season of growth commences. I think the addition of one or two mineral manures for certain crops will be found economical and productive of good results. Sewage cannot be used advantageously on old grass land, or for growing corn, and the scarcity of green crops in this country renders their cultivation the most remunerative, either as food for man or for conversion into milk, butter, or meat. On a farm of 100 or 120 acres, there would be sixty acres under Italian rye grass, which, with a small amount of extraneous food, will keep 300 cows through the growing season, but in many places it is found profitable to sell the grass on the ground. As to the money value of sewage, chemists have estimated it at 8s. 4d. per head per annum, but in practice we have not yet approached this; the gross return has not been more than from 4s. to 5s. a head; but it must be remembered the whole system is completely in its infancy, and further experience will bring with it considerable amendment. As examples of what is being done in England, I may mention the farms at Barking, Croydon, Norwood, Bedford, as furnishing instances, out of some twenty or thirty, of what is being done; also Mr. Hope's farm, near Rumford, which from present appearances promises to be a most important example. My own farm on the Government land at Aldershott is an instance of reclaiming land by sewage, and which is about the most barren soil in Great Britain; fair crops of grass, potatoes, and cabbages are grown on part of it, but its natural poverty makes extraordinary demands on the sewage. Looking at these farms as means of purification, they may

be considered a success, as shown in the analysis of the effluent waters made by the Rivers Commission; their inquiry as to the effect of these farms on the health of a neighbourhood was equally satisfactory. The economic use of sewage is really a national question, bearing very materially on the food-producing power of the country, not merely from the utilising of the sewage itself, but also indirectly by manure produced from the consumption of so large an addition of green food, where its application to the land becomes general. Milk and butter will be produced at one-third less than their present price, and it will be found that when effectually fulfilling the agricultural conditions, it will of necessity accomplish the sanitary object also. Instead of compulsion being needed for its adoption, we shall have active competition.

CHESTER CATHEDRAL AND THE BRITISH ASSOCIATION.

On the 22nd ult., when, the scientific dissipation of the week being over, the members of the British Association were scattered over the places of interest within reach of Liverpool in various excursion parties, a short lecture on the ecclesiastical and architectural history of the cathedral was given by the Dean of Chester, to those who had chosen that city as their rendezvous. An audience, sufficiently large to throng the chapter-house, responded to the dean's invitation to meet him there at noon, when they listened to a discourse necessarily concise (owing to shortness of available time), in which, however, the main divisions of the history of Gothic architecture were broadly defined, and illustrated by reference to a plan of the cathedral, coloured so as to represent the approximate dates of each portion. Plans of Ely, Norwich, and Canterbury Cathedrals were exhibited also in illustration of principles of planning in Gothic cathedrals, especially with regard to the termination of the eastern end, and the various possible application of apsidal chapels in that situation. A good many facts relating to the history of the cathedral, communicated on the occasion, have already been fully noted in our report of Mr. Scott's recent lecture at Chester. The Dean drew special attention to the affinity between Chester and Bangor Cathedrals in many points, and also to the fact that Chester was one of the few cities possessing two cathedrals, or *ci-devant* cathedrals (Rome, Dublin, and London being the only other instances known to him), as the Church of St. John was the original Cathedral of Chester, the present cathedral having only been so constituted, from its original condition of an abbey church, in the reign of Henry VIII. Attention was also requested to the remarkable design of the piers carrying the vault of the vestibule to the chapter-house, which have no impost of any kind, the mouldings of the pier branching straight out to form the vaulting-ribs; and also to the octagonal apse with high-pitched roof, which once formed the eastern termination of the south aisle of the choir, and is now being restored;* a model of the restoration of this portion was exhibited, and compared with a drawing of a similar feature now existing at Norrey, in France. The party subsequently accompanied the dean round some portions of the cathedral, pausing to hear some remarks from Canon Blomfield relative to the monument to Bishop Pearson placed in the cathedral some years back, and which it appears was first suggested (a prophet having "no honour in his own country") by the comment of some Transatlantic visitors, who were surprised to find no monument to so eminent an ecclesiastic in the cathedral where he had formerly held episcopal sway. The Lady Chapel and the "King's School," with its picturesque reading-pulpit, were visited; and on adjourning to the exterior the party congregated at a point under the city wall affording a good view of the south-east portion of the cathedral, where the dean pointed out the illustrations of the various periods of Gothic exhibited in different parts of the structure. Certain inquiries were made by visitors of geological tendencies as to the nature and locality of the stone employed in the new work, and the possibility of its standing better than the original stone, on which latter point answers could be little more than conjectural; sandstone, from the same formation, being, of course, a *sine qua non* in harmonising the new work with the old. The stone now used, being from one of the hardest and closest beds in the district, we must hope for the best. Had the original builders thought of going to the expense of getting some harder stone from a more distant neighbourhood, the present Dean and Chapter would not now have the task of raising such large sums of money to revivify work which was nearly falling to pieces; the moral of which reflection is obvious. At this point the party had to leave the cathedral, to keep appointment with the Mayor, who had invited them to visit the new town-hall, and a premature stop was necessarily put to an inspection which might have been productive of much greater interest, had another hour or two been fortunately available.

The restoration at the cathedral is actively progressing, and the whole of the tower is now recased, and surmounted by new pinnacles, somewhat altering the old well-known outline. When the work in the nave and elsewhere is nearer completion, it may be a more fitting time to go farther into detail as to what has been done and discovered, about which there is a good deal of interest to be said. At present we will only pause to rebut the criticism of a literary contemporary, which affirmed recently that "artists" would justly lament the loss of the old picturesque weather-worn tower. Now, we are certainly no advocates for undue or premature restoration; but we must be allowed to observe that when such a structure as a large centre tower has reached that condition in which it may best be likened, to use Dean Howson's own words, to "an old sea-beaten rock," when not only all the design is obliterated, but even the very masonry reduced to a conglomeration of rounded shapeless masses, mere prudence demands either removal or restoration; otherwise "the picturesque" might some day come down on the artists' heads, which even they would perhaps object to. While at Chester, we may say a word as to another piece of interesting restoration now on hand on a smaller scale, and which was also visited during the day by members of the "Association" party. Most visitors to Chester will remember the old red-brick house overlooking the Dee from St. John's churchyard, and noted as the residence, during part of his boyhood, of that erratic genius, Thomas de Quincy, of opium-eating celebrity; the very house, indeed, if we remember rightly, whence he made, one early morning, that strange desperate flight, so graphically described in the "Confessions," from dulness and respectability to Arab life in the London streets. This house is now pulled down, disclosing the old chapter-house of the once Cathedral of St. John, over which the house had been built, and which, in pre-restoration times, was used as a washhouse and laundry by the tenants. A very good late Norman window in the wall above, preserved from the weather for some time past by the modern house built over it, is also uncovered. The chapter-house, a small apartment, about 15 ft. square, has the centre pier so common in Gothic apartments of this class, with vaulting ribs springing from it; but the peculiar feature noticeable in the vestibule of the Cathedral chapter-house, the absence of impost, is repeated here in a still more curious form, for instead of the mouldings of the vaulting ribs running straight through to the ground, the pier here is octagonal, and the vaulting-ribs rise straight from the top of this octagonal pier, their sections butting perpendicularly upon it, without the slightest horizontal moulding of any kind to mask this abrupt transition. At the foot of the pier a well-preserved and delicate base, of Lancet, or perhaps late Transitional period, marks the approximate date of the work. This restoration is being carried out at the cost of the present Marquis of Westminster, under the direction of Mr. Douglas, architect, of Chester.

* It will be remembered that in a former article on the restorations at Chester we raised a question as to the advisability of restoring this portion of the aisle in this form; at all events, so far as the high roof is concerned. The apse is all very well; but the roof having long since disappeared, we cannot but regard it as a mistake to restore what can only be called a freak in design, which can have no archæological interest when merely reproduced by the modern restorer, and which architecturally will certainly appear an excrescence, out of keeping with the general expression of the building, which is emphatically that of repose.

The late Mr. Braithwaite.—The death is announced of Mr. John Braithwaite, civil engineer. From the earliest formation of railways he has been engaged in their construction, both in England and on the Continent. He was seventy-three years of age.

A NOTE IN SOMERSETSHIRE.

Yeovil.—With the foot and mouth disease raging over Somersetshire and most of the western counties, the sanitary state of Yeovil (one of the principal towns) is anything but encouraging. Bad sewerage and drainage, and an insufficiency of good water-supply are not the least of the wants of this town. Take an outline picture of Yeovil at this moment: foul open drains; unremoved nuisances; a fine old Gothic church, *i.e.*, "The Lantern of the West," one of the finest in the county, with mean and filthy surroundings; a dead inspector of nuisances, and a living one voted as not wanted; a local board or town council, in want of money, and yet voting it away; new waterworks hanging fire for several years; civil and ecclesiastical improvement ditto; a town clock, with a dirty face, which it has at last been resolved upon to wash; and (tell it not in Gath) several of the town council with not over-clean tongues. It is to be hoped that a change will be soon discernible, and that it will not be shelved for a twelvemonth, like the recommendation of the improvement committee anent the churchyard-wall buttresses.

Castle Carey.—Some sewerage works have been commenced here, which for many years were badly needed. The estimated cost of the present effort is set down at 1,000*l.*, a sum we should think insufficient to assure anything like a thorough system of sewerage for the town. If the work be done well, the money will be well spent, but half measures do not even establish an equilibrium between disease and health.

A GLIMPSE OF GLASTONBURY.

The readers of the *Builder* have been often told something of saintly Glastonbury and its historic structures and memories,—the old Abbey, St. Michael's Tower, the Abbot's Kitchen, St. Joseph of Arimathea's Chapel, the old Market Cross, and the old Inn. But it is not with these we would deal just now. Glastonbury of to-day has bad drainage and a defective water supply; and these wants are producing obvious results. Scarlatina, diphtheria, and other dirt-produced diseases are breaking out, and are about to keep pace with the cattle plague, now prevalent in the country. Added to this, another no less frightful evil is common in the town—drunkenness and consequent disorder. The public-house system of the town is loose, and on Sundays more than on other days, even during service-time, the "swilling" goes on, and the week's hard earnings of working men are foolishly wasted amid greetings that generally end with growlings and kickings. The inhabitants are partly to blame, as well as the authorities, that such a state of things should exist. If either or both have no respect for themselves, they ought, at least, to have some for the town which they call theirs. This is hardly to be expected, however, on the part of inhabitants who have for years plundered the old piles of their sculptured wealth to deck their own miserable edifices. Let any one walk through Glastonbury to-day, and if he possesses the eye of either a workman or an artist he will perceive pieces of doors, mullions, columns, and other carved and finely-chiselled work stuck here and there in the mean buildings through the town for support or ornament. Cleanliness, it is said, is next to godliness, but it would appear that not a minority of the folk of Glastonbury seem to be leaving it farther and farther every day. It is doubtful whether the apparition of the good St. Michael or St. Joseph of Arimathea would be sufficient to scare it back into a sense of public propriety or common duty.

ABOUT CONWAY CASTLE.

Such of the members of the British Association as visited Conway Castle were guided over it by Mr. H. Vale, the present president of the Liverpool Architectural and Archæological Society. In the banqueting-hall of the castle, he said:—We may consider the reign of King Edward I. the epoch of the grand style of accommodation and magnificence combined in castle architecture. When engaged in the crusades "he surveyed" with satisfaction, as Dallaway observes, "the superior form and strength of the castles in the Levant, in the Holy Land." The introduction of parti-coloured stone in the quoins and dressings of Conway

Castle, as also in Carnarvon, serves to strengthen the idea that we owe these castles to such an Eastern origin. This stronghold is one of those called Edwardian Castles by the archæologists, of which kind there were five in North Wales—namely, Beaumaris, Carnarvon, Caerphilly, Harlech, and Conway. The chief characteristics which distinguish these Edwardian castles from the earlier Norman ones, are the Great Hall of Audience or Ceremony, and the introduction of inferior towers, and overhanging turrets, bartizans or bretises, projecting from towers or angles, and the more frequent herse, or portcullis. The earlier Norman castles were without these portcullises, or only protected by one; but at Beaumaris, Carnarvon, and Harlech, three exist under every gateway, and at Caerphilly they form obstructions at the end of every passage or mural gallery. Conway was protected by one or more portcullises. The audience-hall at Conway was unusually splendid; the ribs of the stone arches of its roof may still be seen. This apartment was 130 ft. long, 30 ft. wide, and 20 ft. high. The ground-plan of this hall conformed to the bend of the outer wall, adapting it to the nature of the site. Beneath the hall was extensive cellarage for ammunition and provisions. The other characteristic of the Edwardian castle, namely, the turrets rising above the larger towers, are well accentuated at Conway, and served as staircases leading to the summits of the larger towers, the latter being 40 ft. in diameter. Another special feature at Conway is the beautiful little groined oratory, or private chapel, in the Queen's Tower, the absence of a fireplace in which apartment has pointed to its appropriation as a chapel. Conway Castle was completed by Edward I., in the year 1284; and H. d'Earlton, who designed Carnarvon Castle, is supposed to have been its architect, although the characteristic features to which I have referred are said to have been copied by Edward from some of the fortresses in the East, whither he had gone in the year 1270 as the leader of the British crusade. In 1282 he subjugated the Welsh under Llewellyn, and proceeded to construct his castles in Wales, the leading features of which generally may be summed up thus:—To render the entrance or gate at once magnificent and impregnable; to secure the garrison, and to enable them to annoy the besiegers; to delude the besiegers to attack the strongest parts, by giving them the appearance of weakness; to put their prisoners, provisions, and implements of war out of the reach of danger; to convey the engines of war to any part of the castle with ease and expedition; to communicate intelligence to any part of the building; to supply the garrison with water; to convey away the smoke and sewage; to provide a commodious and safe habitation for the king and his household; all which conditions will be found to have been met with in the Castle of Conway and the other Edwardian fortresses. . . . . When Richard II. came to Conway, in 1399, the castle was kept by fifteen men-at-arms and six archers. In the Civil Wars it was held by Archbishop Williams for the king, but who, it is said, changed his party, and assisted General Mitton to reduce the place. At the Restoration it was given to the Earl of Conway, who stripped it of its more valuable materials, sending them to Ireland in vessels which are said to have been wrecked, and the whole of the property lost. The mortar of the walls is very hard. Some of the inner surfaces appear to have been plastered with a very tenacious material. The overhanging of the tower near the railway is a good evidence of the cohesive nature of its ingredients. The walls which enclose the military station protected by the castle are a mile and a quarter in circuit, with four gateways and twenty-one small towers, built, as some have said, a bowshot range apart, the whole being encircled by a ditch or fosse. When we take into consideration the skill shown in adapting the ground-plan of the castle to the peculiarity of its site, combined with its gracefulness of outline, we may conclude that the designer was not only a good engineer, but also an architect of no mean ability.

Dispersion of a Museum at Keswick.—Crossthwaite's Museum, which for the last ninety years has afforded much edification and gratification to its numerous visitors of all classes, especially antiquarians and naturalists, has been distributed by Mr. C. P. Hardy, of Carlisle, in upwards of 1,500 lots. There were in it extensive collections of Roman and Saxon antiquities, minerals, skeletons, shells, &c.

NEW SCHOOLS AT COLLYHURST.

The foundation-stone of branch schools, in connexion with the Albert Memorial Church, Collyhurst, was laid on Saturday, by Mr. Robert Gladstone. The site of the new schools, which will be in the Gothic style of architecture, is at the junction of Sanderson-street and Rowbotham-street, and contains 1,200 square yards. The plan of the building comprises mixed school, adjoining class-room, and infants' schoolroom, the former and the latter being merely separated by a framed partition. The buildings externally will be faced with selected brick, white headers, relieved with different colours, and the roof of high pitch, with open framed principals. The mixed school will be surmounted with a lofty belfry. In addition to playgrounds attached to each school, a teacher's residence will be provided, the whole of the plans having been prepared in accordance with the requirements of the Privy Council. Each of the schools and class-rooms will be fitted with the necessary seating, desks, and galleries, affording accommodation for 231 children. The cost, including the inclosure walls and fittings, will be 1,250*l*. Messrs. Wade, Brothers, Miles Platting, are the contractors; and Mr. J. Low, Manchester, is architect for the works.

NEW CORN EXCHANGE, DONCASTER.

On the 22nd ult., the Mayor laid the first stone of the New Corn Exchange and the south-east wing of the Market-house. The market improvements of Doncaster are amongst the most important works which the Corporation have undertaken. Mr. William Watkins, of Lincoln, is the architect. The exchange is 91 ft. 6 in., by 84 ft., inside measurement, and although chiefly intended for a corn exchange, is also designed with a view to large public assemblies. The interior is divided into what may be called nave and aisles, the centre portion or nave being 58 ft. wide, spanned by six semicircular wrought-iron lattice ribs, without cross ties of any description, so that there will be a clear and uninterrupted space from the floor to the apex of the roof inside of about 63 ft. The ribs are connected laterally by ten wrought-iron longitudinal T pieces, placed between two pieces of wood, upon which are fixed the rafters of the roof, which are cut segmental on the underside to follow the lines of the main ribs. Along the entire length of the Exchange is a lantern light, and lower down the roof on each side, also the entire length of the Exchange, are additional skylights, measuring, together with the lantern light, over 50 ft. by the entire length of the room, thus giving a lighting surface of over 4,500 superficial feet for the nave portion alone. The main ribs of the roof are supported by coupled cast-iron columns on each side, having ornamental caps, bases, and bands. These columns are connected laterally again by semicircular cast-iron double ribs, with ornamental soffit plates to connect the ribs. Galleries are provided on three sides of the Exchange, viz.,—Over the settling offices and principal entrance, and over what has been here called the aisles, for the purpose of giving increased accommodation to meet the exigencies of large public assemblies. The gallery fronts are supported by the coupled columns of the nave, and are attached thereto about midway between the caps and bases. Transverse wrought-iron girders connect these columns at the gallery fronts with the side walls; and there are also similar girders connecting the columns longitudinally, by which means great stiffness to the columns is secured. The gallery roofs are formed with semicircular cast-iron ribs spanning the gallery, and supported by the coupled column of the nave at one end, and the side walls at the other. In addition to the top lights, there are windows in every position where they can conveniently be arranged.

The principal entrance to the Exchange is in the centre of the front, the external opening being 15 ft. high by 9 ft. wide, leading into a recessed porch 18 ft. by 8 ft., from which are two large doorways, exactly opposite to the front entrance leading into the Exchange. Right and left of the recessed porch are entrances into small settling offices, from which again are doorways leading into, and both may be used as entrances to, the Exchange, at large public meetings, instead of the front doorways proper, which would entirely prevent a cold draught of air. They may also be used as well as the front doors proper, thus giving additional means of exit. There are side entrances to the Exchange, also through recessed porches or lobbies beneath the side galleries. The front of the Exchange is flanked by angle staircases, having separate external doors leading to the galleries. Thus, there are five separate and distinct external entrances and exits; but there are four doors leading from the large central entrance to the Exchange, so that there will be practically eight doorways which may at any time be used as exits.

The external elevation of the Corn Exchange is in the Classic style, to accord with the present buildings; the Tuscan order being employed for the ground story, surmounted by that of the Doric, the columns and pilasters being properly spaced. The cost of the new works is estimated at about 15,000*l*. Mr. Athron, of Doncaster, is the builder.

RETURNS OF METROPOLITAN DISTRICT SURVEYORS.

The superintending architect, Mr. G. Vulliamy, has published the Fourteenth Report on the Monthly Returns of District Surveyors, under the Metropolitan Building Act.

The total of the gross fees received for the year is 33,246*l*. 19*s*. 6*d*., in respect of 19,947 works, of which more than two-thirds were done within the year.

The gross fees received in 31 districts vary from 48*l*. to 479*l*., six being under 200*l*. each, eight under 300*l*., nine under 400*l*., and eight under 500*l*. In 27 districts the incomes vary from 511*l*. to 1,869*l*.

The expenses of district offices are 7,535*l*. The fees remaining due for all arrears are 28,924*l*., but probably mostly of little value. The sums abated or lost are 4,693*l*. Compared with the results of some former years, the present abstract shows a considerable decrease.

	Works.	Fees received.
In 1856	14,654	£19,934 14 11
„ 1857	15,330	21,969 11 4
„ 1858	15,500	21,732 11 2
„ 1859	15,558	22,385 9 2
„ 1860	15,030	22,791 2 3
„ 1861	14,008	21,586 2 8
„ 1862	15,707	25,315 2 3
„ 1863	17,954	29,442 9 9
„ 1864	18,984	31,803 5 2
„ 1865	19,251	32,972 7 9
„ 1866	20,196	34,989 11 4
„ 1867	21,3 3	36,674 6 0
„ 1868	21,915	37,790 13 5
„ 1869	19,947	33,246 19 6

STANMORE.

This house, of which we give an illustration, has recently been erected on the estate of Mr. John Pritchard, near to the picturesque town of Bridgnorth, Shropshire, under the direction of Mr. J. W. Hugall, of Oxford.

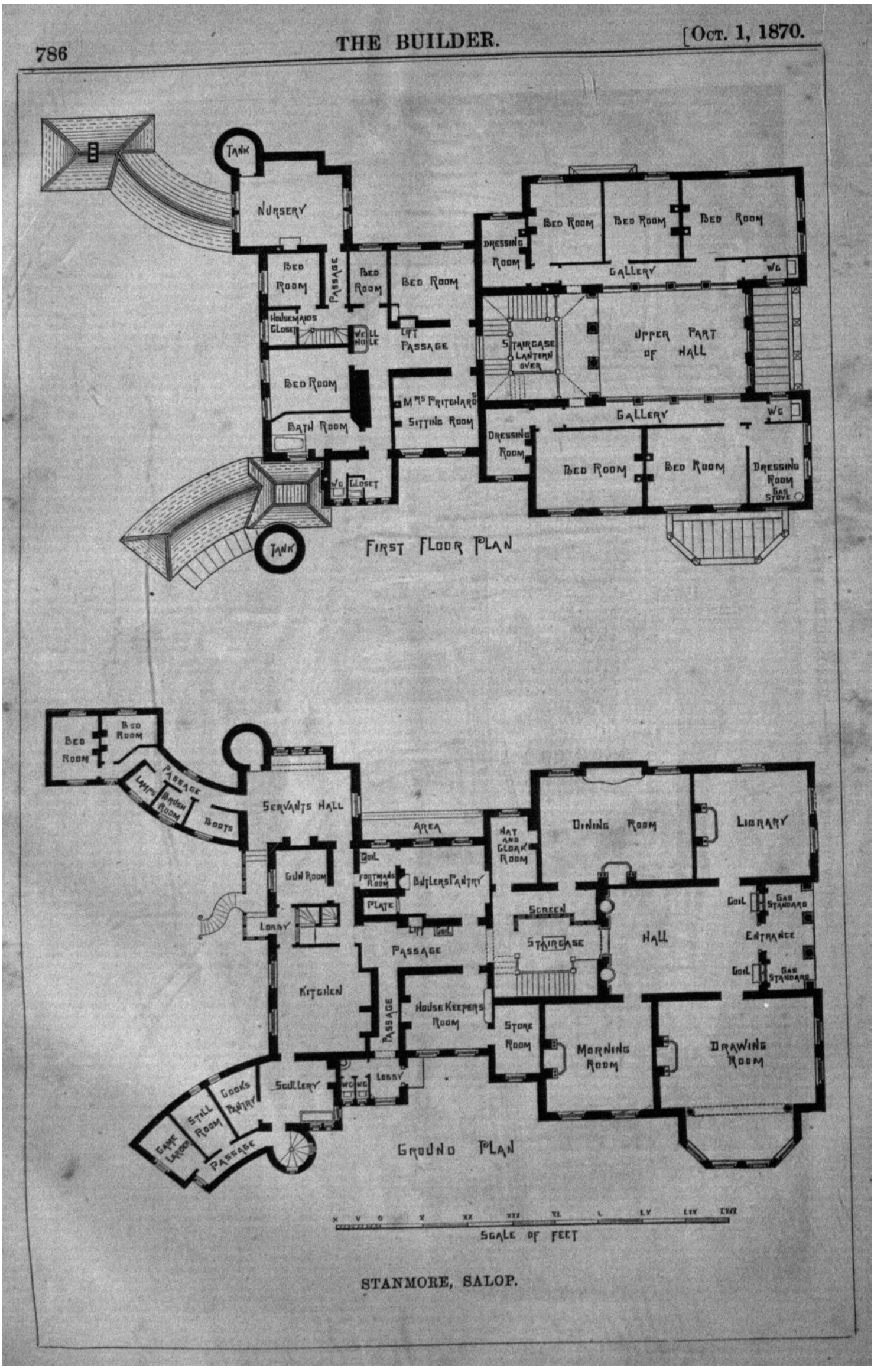
The site selected is very high, and the grounds are beautifully varied with an extensive view across the Severn valley, along which the river is seen to flow at various points.

The house is built of pressed red brick from Broseley, with Bath stone dressings, and is covered with red and blue tiles, arranged in lines. The flats are covered with Vieille Montagne zinc, by Fox; and the cresting and finials, of wrought iron, surmounting the roofs, together with the gas-fittings, balustrading, and coil cases, are from the works of Messrs. Thomason & Co., of Birmingham; Messrs. Edwards, of Great Marlborough-street, fitted up the hot-water apparatus, the culinary arrangements, and the laundry; Mr. Coulman, of St. Mary Church, near Torquay, supplied the marble mantel-pieces, slabs, inlays, and columns; Mr. Steinitz laid down the parquetry in the entrance-hall; Messrs. Jackson executed the very elaborate ceilings in their fibrous plaster; and the general contractors, Messrs. Wall & Hook, of Brimscombe, have carried out their various works with care. Water and gas have been laid on from the town of Bridgnorth, a distance of two miles.

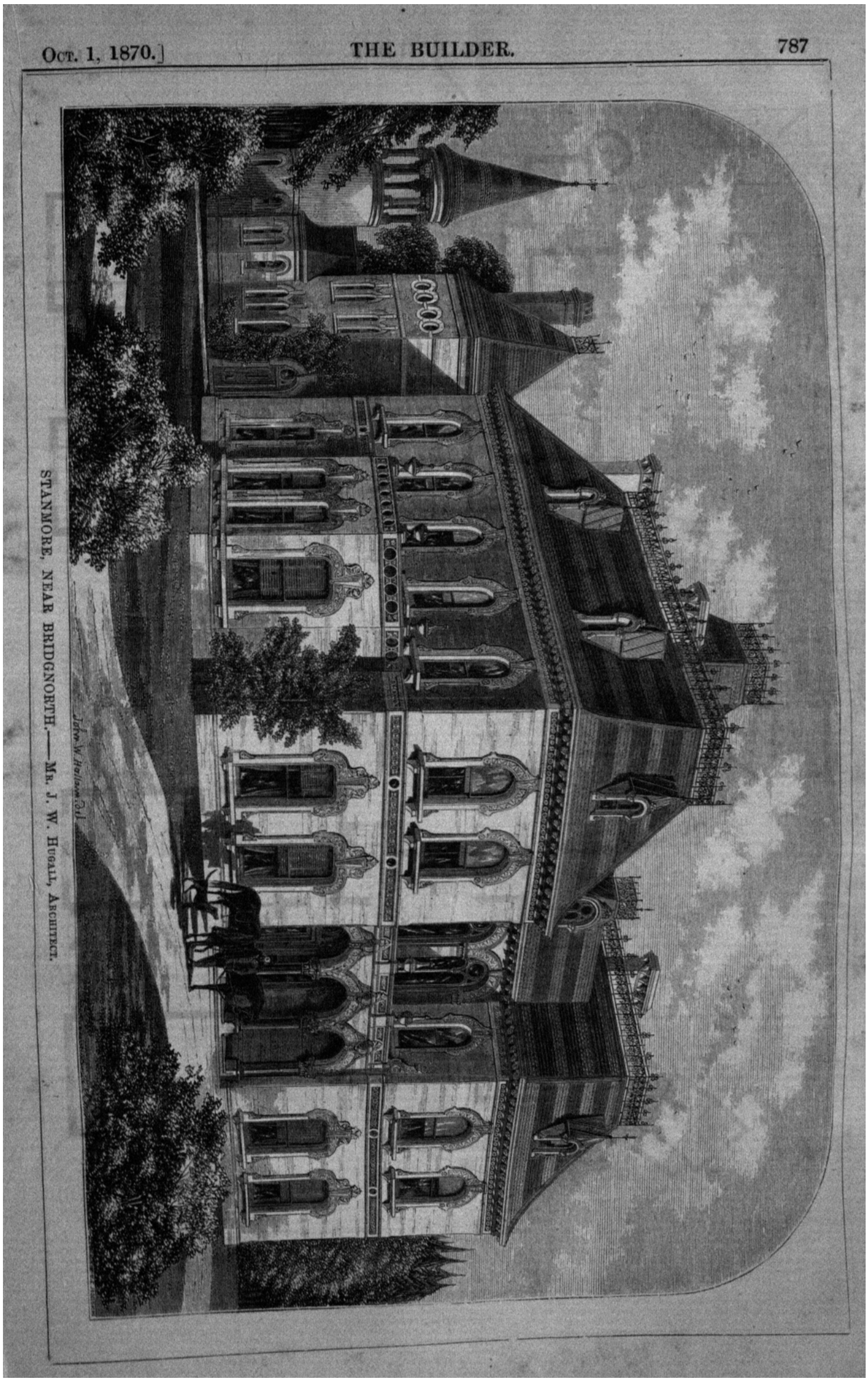
The principal and some subsidiary rooms have a line of hot-water pipes passing through them, and coils are placed in the halls, covered by wrought iron and brass cases with marble slabs. A lift for luggage reaches from the basement to the attics. The principal staircase is of oak, and enclosed beneath, to form a serving passage to the dining-room.

The house being erected on a slope of the ground to the north, advantage has been taken of it to form a basement for laundry, larders, cellarage, and so on.

A considerable quantity of stone carving is executed both externally and internally.



STANMORE, SALOP.



STANMORE, NEAR BRIDGNORTH.—Mr. J. W. Hugall, Architect.

JEWISH SYNAGOGUE, EDGWARE-ROAD.

There is a movement amongst the Jews. A few months ago we chronicled the opening of a synagogue, to hold 1,000 people, in Great Portland-street, then one in Chatham, and we now have to mention the consecration of another building of similar size. This last is to be occupied by what we may term a body of Jewish Dissenters.

The new building is erected on leasehold land belonging to the Portman Estate, and held by the trustees for a term of ninety-nine years only.

It is Byzantine in character, and a square on plan, measuring 70 ft. each way, and with a wide gallery along two sides and the western end; the ceiling consisting of a large central dome and four small domes in the angles, and four great arches covering the side spaces. This ceiling is carried by four piers of clustered columns of Devonshire marble, with carved capitals. At the east end of the building is a domed semi-circular recess, or apse, in which is placed the organ and choir; and in the centre of this apse is placed the ark or shrine, the receptacle for the scrolls, constructed of marble. The placing of the choir at the east end of the building, and facing the congregation, is a peculiarity.

A gangway is reserved all along the side walls of the building, so that persons coming in after service has begun may reach their seats without disturbing the mass of the congregation. The occupants of the ground floor, 500 in number, pass out through two 5 ft. wide doorways into a corridor 10 ft. wide, and similar means of egress are given to the 500 occupants of the galleries. Where the occupants of the galleries and ground floor meet, the hall or atrium is 20 ft. wide, and the opening of the great arch and gates in Upper Berkeley-street is of this width.

In this building the decoration of the flat surfaces depends entirely on combinations of simple Geometrical forms, picked out with colour, and on the leaves and flowers introduced in the carving; and here the lily, the pomegranate, olive, fig, and palm, are the types which are conventionalized.

The building has been erected from the designs of Messrs. Davis & Emanuel, by Messrs. George Myers & Sons. The marble work of the ark and choir-screen, reading-desk, and pulpit, is by Messrs. Poole & Sons. The pitch-pine seating is by Mr. W. H. Lascelles; the gasfittings are by Messrs. D. Hulett & Co.; the main portion of the stone carving is by Mr. Williamson; the system of hot-water-pipe heating and ventilation has been carried out by Mr. W. W. Phipson, C.E.; and the stained-glass windows are the production of Mr. A. F. Usher. The organ has been built by Messrs. Gray & Davidson, at a cost of 1,200*l.*; and the total cost of the building will be about 20,000*l.*

THE CONINGSBY ARMS.

Sir,—I trust to your kindness to allow me space for a few words in reply to the letter of your esteemed correspondent, Mr. Gough Nichols, in your last number.

Commenting on my brief description of the Coningsby Arms, as sculptured on the front of the Coningsby Hospital, Mr. Nichols considers that I am wrong in describing the bearings, and pronounces them to be,—not a lattice-fence inclosing "conies," but the arms of Coningsby impaling Fitz-Williams, which latter he describes as "lozengy." As he gives no authority but Dingley's "History from Marble," a mere collection of pen-and-ink sketches, which may or may not be accurate in the details of the drawing, I should like to suggest some reasons why I do not regard that work as conclusive evidence.

1. The bearings seem to me to be *fretty*, and not "lozengy," resembling rather the bearings on the shields of Irby, St. Leger, and others, than the solid-looking lozengy of Fitz-Williams.

2. There is no perceptible line down the centre of the shield, as in all other modern impalements that I remember. I quite agree with Mr. Nichols that the Coningsby coat is not an old one; if it were, I should expect to see the two coats on separate shields side by side, as in the case of the arms of Derby and De Watts, in Chesterfield Church, Derbyshire.

3. I regret to be obliged to dissent from Mr. Nichols's remark that the bearings, as I described them, would be "remarkable indeed." Similar bits of nature, with and without "fences," occur in a number of coats, *e.g.*, those of Lord Lismore, Lambert of London, and the boroughs of Saffron Walden, Andover, Beccles, Berwick, Camelford, Chester, Derby, Hartlepool, Hertford, Huntingdon, and Launceston.

4. The corruption of the name Coningsby into Conisbie is not old, and did not last long. Sir Thomas Coningsby, who built the hospital, spelt his name "Conyngsby" (Townsend's History of Leominster). The present spelling was in use in the time of Pope:—

> "The House impeach him, Coningsby harangues;
> The Court forsakes him, and Sir Balaam hangs."

As to my principal remark, that the coat is an example of canting and punning heraldry, you have sufficiently vindicated me, leaving me nothing to add but that I am, &c.,

Flavell Edmunds.

WESTERN SYNAGOGUE, ST. JAMES'S, LONDON.

The Western Synagogue, in St. Alban's-place, Charles-street, was re-opened on the 18th ult. for service. It has been repaired and decorated in quiet good taste, under the direction of Mr. J. D. Hayton, architect.

This synagogue was built in the year 1828. The congregation, which was established A.M. 5534 (1774), worshipped previously in premises situated in Denmark-court, Strand.

The whole of the flooring, as well as that to the gallery, is covered with kamptulicon of extra thickness by Messrs. Gough & Son.

Messrs. Buchan & Son, of Southampton, were the contractors for the repairs, painting, and decorations, and they have very creditably and satisfactorily carried out their contract. Messrs. Hulett & Co. have executed the sunlights and gasworks.

The expense of the whole of the works has been defrayed by Mr. Moss Isaacs.

THE INFLUENCE OF BAD FOREMEN.

Sir,—I have read your recent articles upon the technical education of the artizan with attention; but, while concurring in your remarks, it has struck me that in numbers of instances, many of which have come under my notice, a technical education is of very little use to the operative. This is owing to the working system now in use in the building trade. In nine out of every ten establishments, one man—the foreman—has supreme control, and can employ or discharge whomsoever he thinks fit. In not a few instances have I seen the educated workman dismissed for simply knowing too much; which is quoting a favourite saying. The moment it is noticed by interested officials that this or that man can strike out his own work from a rough sketch or regular drawing, that moment he is looked upon as one to be guarded against, and at the first opportunity, if circumstances permit, gets his "back day." Much has been said from time to time about the "proper understanding" which ought to exist between masters and men, but this will never be until the masters trust their men as a body more than they do at present. They always seem to have a proper understanding with their respective foremen, twenty per cent. of whom add to their income by a system of trafficking, which demoralises the men while it takes considerably from the employers' profits. By the present working system, a foreman who has supreme control over fifty or sixty men can add to his salary by receiving weekly pay from inferior hands, who are always to be found ready to tender the bribe in return for being kept in constant work. Under such a system the educated artizan, who is generally a spirited man who would not stoop to such a practice, is sure to be the sufferer.

Besides the weekly pay, which is a common practice, there is another method by which the foreman, or deputy foreman, in charge of a job, and who generally keeps the time-book, can augment his pay. There are in a firm, say twenty *old hands*, favourites, who can be consequently trusted by officials inclined to do a bit of "jobbing." If these constant men happen to lose any time, suppose two hours a week, on an average, their full time is returned by the jobbers to the pay-clerk, and the two hours' pay, which was never worked for, handed to the foreman or deputy, as the price of his favour.

What leaves so many married men always in a struggling position? Bribing the foreman, or "boozing" his deputy. Why are so many operatives drunkards? Because the deputy or confidential man likes his beer, and looks to the men under him for a treat or treats as the price of his favour. Between bribing the foreman, and supplying beer to his deputy, the man who has a wife and family can save nothing for the rainy day. If one of these men knew an operative to be technically educated, he would stand a bad chance of keeping his place, for reasons which are very obvious.

The writer who calls for the technical education of workmen for our workshops also suggests that masters should be taught in like manner. If they were, and showed a more friendly feeling and inquiring spirit amongst their men, there would be better results from the money earned. A master once said to me, "You are one of the firm, and ought to take as great an interest in it as I do myself." I felt this was a good saying, if there were no too-much-trusted officials between us.

A Journeyman Joiner.

MAN THE BOATS.

Sir,—The following remarks will perhaps render my last letter more fully understood.

In the system proposed it would be necessary to hoist the boat from the deck, and when hoisted to remove the falls into the boat ready for lowering, and in order to do this there must be some means to suspend the boat for the time independently of the falls.

To do this it will be necessary to have an additional sheave on the axle, that the sheaves of the upper block (being, as before stated, part of the davit) turn.

Then to hoist the boat, heave on the falls, and when high enough, the man in the boat will make fast to rings to receive these two ropes, each running over the additional sheaves in the davit at its end of the boat; these ropes will then be made fast on board, and the boat will be suspended for the time without the falls, and which can be coiled into the boat ready for lowering; but in order to prevent the chance of accident through the ropes suspending the boat not being properly made fast, or cast off too soon, it would be well to have an overhanded, or Turk's head knot made on it, to prevent it from running out through the sheave-hole, and thus letting the boat down.

Then, in lowering the boat, it will be necessary for the man in it to cast off the ropes it is suspended by, the falls having been previously placed in the tube described in my last (and which must be strong enough to prevent its being torn apart or broken), and if necessary temporarily lashed together beneath the tube. If so, he will then cast off such lashings and pay out the falls, and lastly, cast off the tackling when the boat has taken the water. The boat will then of course have a painter to prevent her from being carried away by the current before her crew can jump into her. When the falls shall have been cast off, it will be necessary to take the end of each one on board preparatory to rehoisting. The lower blocks will, in the mean time, if rough weather, be likely to dash with great violence against the hull, and should therefore be of suitable material and of the best possible shape to prevent shivering; for this purpose it would be well to have attached small fenders so placed as not to impede the working.

Concerning the tube for paying out the falls when in the boat the following method (if not already invented, and which I am not aware that it is) would perhaps be an improvement.

Suppose a piece of, say 2-in. elm plank, 2 ft. long and 1 ft. wide, to have four sheaves, each ¼ in. thicker than the diameter of the fall, and two of these to be placed on axles running through the elm plank, and near one end, and so that these sheaves shall have the grooves in their circumference rather more distant apart than twice the diameter of the falls, so that they can both be rove through on these sheaves without chafing each other; then, if the other two sheaves be similarly placed at the other end of the elm plank, the falls can be continued and rove out at this last-named end of the elm plank, and if the sheave axles were left long enough, we could put on this side a corresponding piece of elm plank, and we should now have a block with the falls rove through.

The writer goes further into description, but it needs diagrams to make it of any value.

* * * * *

If, underneath, a thwart, at the middle of the boat's length and on one side of the keel (under-

neath the boat), were to be formed of, say 1 ft. 6 in. by 1 ft., and rising in the bottom of the boat about 8 in., a box, and this to have, to rise from its centre, a pipe having a water-tight piston (with a collar at top to prevent its dropping through), and to the bottom of the piston to be secured a water-tight box of wood or leather (or perhaps of cork), to be very light and strong, and to rise up into and fill the hollow box previously formed in the boat to receive it (and which would be better made with a draught of 1 in. in 8 in., to allow the water to pass): then, this being very buoyant, its lifting power in the water would be 50 lb. or 60 lb.

Now, suppose to the end of the piston there be fixed a small chain on either side to lift a very light but strong lever running along the bottom of the boat at each end, and its end to be turned up at right angles (and to work on a pivot where it turns), and the part turned up to be connected with the rule joint of the bolt. This lever would, perhaps, be best made of exceedingly light ⊥ iron, and it would consist, its long arm of (say) 6 ft., and its return arm (which should have an angle brace) of, perhaps, 1 ft. 6 in.; then the power of the short arm would be four times the power of the long arm.

Now, if we were to balance the long arm by continuing its end, and putting a weight thereto (like the minute-hand of a church clock), we should have available half the lifting power of the piston for each long arm, say that to be 28 lb.; then that would give four times that, or a power of 1 cwt., to force against the bolt at the rule joint (against the 7 lb. spring), and bend it so as to liberate the iron eye or ring of the strap of lower block.

By this plan both the falls must be cast off the instant the boat takes the water at its middle, and it would thus be almost, if not utterly impossible for it to capsize through any fault in the falls, and the lower block could not twist while the bolt passed through its iron eye in its strap; but it would turn on the bolt as a pivot, and accommodate itself to the varying inclinations of the falls in lowering, and it would have the guide-rope (mentioned in my last letter) attached to it, sliding by its ring at its other end, up and down the wire ropes, and which would, of course, be cast off with it.

To rehoist the boat, a man must, by his weight, force down the piston, and there must be a bolt or chain or something to keep it down while he attaches the tackle, and till the boat is quite clear of the water.* Henry Ambrose.

ARCHÆOLOGICAL SOCIETIES.

Wiltshire.—The annual three days' meeting of the Wiltshire Archæological and Natural History Society has been held; with Wilton,—an ancient and interesting town which once ranked first in the county,—as the head-quarters, and Salisbury and some of the most attractive parts of South Wilts as points for excursions. Mr. Charles Penruddocke, of Compton Park, presided. As usual, the society was received with great hospitality; and the programme was unanimously voted a good mixture of business and pleasure. One noteworthy feature was the number of ladies who honoured the society with their presence. General regret was expressed at the affliction cast upon Lady Herbert and the Pembroke family by the news of the loss of H.M.S. *Captain*, in which a son of the house was serving as midshipman; and the intended visit to Wilton House was of course put off in consequence. Other than that there was no drawback to the satisfaction and enjoyment of the numerous visitors. The inhabitants of Wilton were represented in the welcome by the mayor, as well as by two of the hon. local secretaries, Mr. H. J. F. Swayne and Mr. J. E. Nightingale. The scientific and social congress, with its round of addresses, papers, *conversazioni*, excursions, luncheons, dinners, &c., was attended by a large and influential company; although the presence of two or three of the expected *savants* was unobtainable, through the meeting of the British Association being in progress. Among the papers read were:—The Rev. D. Oliver, on Wilton Church; Mr. J. E. Nightingale, on Objects of Interest in the Fonthill Excursion; Rev. G. S. Masters, on Roman Remains recently found at Holbury, near Dean; Rev. J. Heale, on the History of Poyntington; Mr. E. T. Stevens, on the Stone Period; Rev. D. Oliver, on the Stone Avenues of Carnac. The annual dinner was held at the Pembroke Arms Hotel, the mayor of Wilton in the chair. The second day of the meeting was the grand excursion-day, when a distance of upwards of forty miles was traversed along the interesting valley of the Nadder. Starting from Salisbury at nine o'clock, and Wilton at half-past nine, the excursionists numbered not far short of 200 persons, and occupied about thirty carriages of various descriptions, some of which had been hired from Southampton for the purpose. With Mr. E. T. Stevens as pioneer and manager of the excursion, the lengthy and somewhat novel procession was kept together in excellent order. Next day the excursionists, about 100, went to Longford Castle.

An Archæological Society for Dorset.—Under this title the editor of the *Dorset Chronicle* proposes the establishment of a new society.

* *Erratum.*—In my last, for "double tape" read "double tube."

AID TO THE ARTS IN FRANCE.

In a number of the *Revue Générale de l'Architecture*, conducted by M. Daly, just received, it appears that Madame la Comtesse Decaen has left to the Academy of Fine Arts, in Paris, the munificent legacy of 120,000*l.*, for the formation of a museum, to be named the Decaen Museum; as also to provide recompenses to the students of the Academy, and to give for three years to those students who have returned from Rome a pension of 160*l.* per annum to the painters and sculptors, and to architects 120*l.* The cause of this difference does not appear; but possibly it may be to cover the expense of models, &c., so essential to the former, but not required by architects. When France gets out of her present unfortunate position, which will, we most sincerely hope, soon be the case, this noble bequest will doubtless produce good results.

THE CHAIRMANSHIP OF THE METROPOLITAN BOARD OF WORKS.

At the first court of the Metropolitan Board of Works since the recess there was a very large attendance of members. Mr. Alderman Gibbons was called to the chair.

Mr. Pollard, the clerk, read a notice referring to the death of Sir John Thwaites, and Mr. Runtz adverted to the sad loss the Board had sustained: the condolences of the Board were agreed to be conveyed to Lady Thwaites.

The letter of the Home Secretary, suggesting that the appointment of a chairman should be deferred or made conditionally, having been read, Mr. Newton moved that the whole matter connected with the salary, duties, and so on, of the chairman, together with the letter of the Home Secretary, should be referred to a committee. The letter, he considered, was an interference with the duties of the Board, and he thought that a conference with Mr. Bruce on the subject should be sought.

The motion was carried unanimously, the committee to consist of all the members of the Board.

ARCHITECTURAL VAGARIES IN EDINBURGH.

Sir,—While the romantic site of Edinburgh and the towering irregular outline of our lofty buildings require so little effort to give the pleasing effect so much admired, we still continue to waste many thousands of pounds, displaying false taste in obscure localities, where plain buildings with more light and more air are only wanted. The tenants are saddled with costly stone and lime excrescences, copies of some baronial reminiscences which have no historic worth, far less present or future utility, to any one, except where sentiment prevails over principle. Allan Ramsay, addressing civic authority here a century ago, gives a hint as to a feeling of principle now wanted in our city improvements, when he says:—

> "Our reason and advantage call
> Us to preserve what we esteem,
> And each should contribute, tho' small,
> Like silver rivulets that fall
> In one, and make a spreading stream,
> So should a city all her care unite,
> T' engage with entertainment of delight."

Now, here we are, sober, sentimental Scotchmen of the period, striving with the imitative ability of the Chinese tailor (who so tastefully copied the patches on the old pattern into the new breeches), reproducing the stuck-to devices of the old builders into new tenements, with damaging effect to the comfort and means of the workmen's families and shopmen who require accommodation.

Such is the distorted taste of the period that even an effort has been made to mar the present perfect symmetry of Charlotte-square, requiring the strong arm of the law to preserve the true Classic taste of our fathers. This noble square is well worthy of being chosen as the site of the grand Scottish Memorial to the late Prince Consort, but, such is the questionable state of public taste, it is more than likely to share the fate of the Ross Fountain,—this, the finest work of art we have of the kind, having been placed in the worst possible position under the cold shadow of the Castle rock,—on the lowest ground of Princes-street-gardens,—where in the same bleak locality a winter garden is planned out to be placed, the design for which being exhibited as art.

Many visitors to Edinburgh think from the costly construction of buildings here, that too many fantastic notions in stone and lime are built for posterity to alter. We experience trouble now by the cost and dust of daily alterations on the massive works of past generations. The Caledonian Railway Company have spent many thousands of pounds in clearing away substantial palatial buildings, which after all are only replaced by a wooden station, which a Yankee visitor said has a useful homely feeling about it. Near the same timber erection, a further clearance of some few thousand pounds' worth of princely dwellings has been lately proposed as a suitable site, at the west end of Princes-street, for the Prince Consort memorial; while alongside that street there are at least two good sites in the garden walk opposite Frederick-street and Castle-street, and best of all a most appropriate site having the vista of Princes-street towards the east, if placed upon the rocks below the Nelson tower. We have in the same view that most symbolic of Scotland's memorials, the unfinished national monument to her brave sons who fought and fell during the wars of the first Napoleon striving to obtain the new waste-paper treaties of the last generation. The new and finished national memorial to "the silent father of our kings to be," would tend, if placed near those solemn columns, to illustrate the triumphs of peace over war? *Sic transit gloria mundi.*

It is proposed to have a statue of Chalmers in marble. As we do not keep such memorials very clean, it would be better that it should be of bronze, and made to match the statues of George IV. and Pitt by Chantrey, as there is yet another site in our noble George-street requiring such a statue. The Chalmers memorial should be placed at the intersection of Castle-street, and we should then have a statue of the regal, lay, and cleric representative men of last generation adorning our finest thoroughfare. As yet in the city of Knox there is no monument to our great reformer, statesman, and divine.

Whatever sentiment or principle guides us in the erection of memorials to our worthies, we cannot boast of being Israelites indeed. We do not garnish the memorials of the past, but, neglecting historic worth, the sectional and sectarian Scotchman of the period needs the genial heart and gentle hand of an "Old Mortality" to remove the weather-stains from freestone and marble memorials of our lay and cleric worthies.

J. K.

MORTUARY CHAPEL, LIVERPOOL.

About five years ago Dr. Trench, the Liverpool medical officer of health, commenced a subscription for the purpose of raising a fund for the erection of a mortuary chapel, to which, with the co-operation of the Roman Catholic clergy and by the attraction of a religious ordinance, the poor Irish inhabitants might be induced to remove their dead between the periods of decease and burial, so putting an end to "wakes" of the dead in their own dwellings. The work, however, was undertaken by a single individual, and the site fixed upon was on the north side of Collingwood-street. The architect chosen was Mr. Henry Sumners, of the firm of Culshaw & Sumners, of Liverpool, who was the designer of the structure; and the builder, Mr. William Tomkinson. The foundation-stone was laid on December 11th, 1866, by Dr. Goss, Roman Catholic bishop. After a considerable portion of the building had been erected, adverse circumstances affecting the fortunes of the donor arrested the progress of the work, and the building remained at a stand until some two years ago, when, funds having been obtained for that

purpose, it was re-proceeded with, and it is now near completion. It forms an architectural feature of the neighbourhood. The style is Gothic of the Decorative period; and the exterior of the entire edifice is executed in Yorkshire stone shoddies, with Grinshill and Longridge stone as dressings. The object in the construction of the building was to assimilate the edifice as much as possible to an ordinary church, and to remove, in an equal degree, the appearance of a mere morgue or dead-house.

The mortuary consists of a nave, 37 ft. by 28 ft., and it is capable of containing, without crowding, twenty-one coffins; it has a distinct entrance from the street, the opposite end of the building to which is semi-octagonal. The sides and end of the mortuary are divided into seven equal bays, the arches of which are supported by eight polished granite shafts, resting upon a Yorkshire stone plinth or basement, the bays being again subdivided by smaller granite shafts supporting intervening arches and tracery. Between the shafts is plate glass, completely filling up the openings of arches and tracery, forming a completely sealed division from the aisles; and thus, whilst a view of the interior of the mortuary is afforded, there is a perfect absence in the building without of any taint or smell. The aisles, which are 19 ft. wide, entirely surround the mortuary, and form the chapel portion of the building, which, to correspond with the mortuary, is also semi-octagonal, except the centre, which is projected outwards to form the chancel, which, together with the aisles, is lighted by three traceried windows, filled with stained glass. The seats are so planned that the whole of the audience face the altar. To the chapel portion of the building there are separate entrances at the side. Above the arches of the mortuary there is ashlar work, and the roof is formed of moulded and curved principals springing from stone corbels, filled in between by boarding, as also is the roof of the aisles. The walls of the aisles are in brickwork, in coloured bands, no plaster being used throughout. The floor of the mortuary is 2 ft. 6 in. lower than that of the aisles, and for the convenience of access, nearly level with the street. The ventilation is by one very large Watson syphon ventilator on the roof; and the chapel is also ventilated and warmed. A sacristy and other conveniences are provided for, being approached from the chancel.

The building, says our authority, the local *Journal*, will be ready for the ceremony of opening in a few weeks. It is in a sufficiently advanced state to indicate all that was intended by its projector and architect.

THE ROYAL ALBERT ASYLUM FOR IDIOTS.

The centre and south wing of the Idiot Asylum for the Northern Counties of Lancaster are now so far completed as to be nearly ready for the reception of patients. The building, which stands on a commanding site about three-quarters of a mile south of the town, near the Lancaster and Preston Railway, is in a modified Gothic style of architecture. It is to consist of a centre, with lofty entrance tower, and two wings. The tower and south wing are already completed. The asylum stands in the midst of sixty-seven acres of land, which are in process of being suitably laid out. The exterior walls are of a light-coloured freestone. The general arrangement of the plan is very simple, and something in the form of the letter E, the main front facing westward being represented by the thick upright stroke, with two wings at the north and south extremities projecting 60 ft. from the front of the main building, and running back 185 ft., and a central projection of 40 ft. extending in an easterly direction to a distance of 250 ft. The greatest length from north to south is 472 ft., and from east to west 340 ft., the total area covered being 5,160 square yards. The principal entrance is in the centre of the main front, and opens into the large entrance-hall and staircase leading to the board-room and the secretary's office. To the right is the residence of the superintendent; to the left the matron's room, waiting-room, &c. Facing the entrance is the large dining-hall, 73 ft. by 35 ft., capable of accommodating 300 inmates. Immediately behind the dining-hall is the kitchen wing, containing a large kitchen, 43 ft. by 35 ft., scullery, pantries, servants' hall, &c. Beneath are the bakeries, store-rooms, &c., communicating with the kitchen by a hoist. To the east of the kitchen wing, at a distance of 40 ft., and connected by a corridor, is the workshop block, 140 ft. by 66 ft., containing workshops for the carpenters, painters, shoemakers, &c., engine-house and smithy, over which are the wash-houses, laundry, &c. Immediately adjoining the entrance hall, and branching off to the right and left, are the principal corridors, 9 ft. wide and 130 ft. long, communicating with the various apartments and with the corridors of the wings. The rooms on the west side of the corridor, both on the right and left, are reserved as day-rooms for the first-class patients. Those on the east side are to be occupied by the schoolmaster, schoolmistress, and attendants. In the north and south wings are the school-rooms, day-rooms, baths, and lavatories. The basement floor is mostly above ground, owing to the natural slope of the ground, and is chiefly appropriated for general storage of provisions, ironmongery, coals, drapery and linen, larders and dairies, tailors' and upholsterers' shops, &c. The principal entrance to the basement story is at the east end of the central block, where goods and stores are delivered and deposited for use. In the south wing are work-rooms and large play-rooms for the use of the inmates in wet weather. The first floor is generally appropriated as dormitories, with the board-room and offices over the principal entrance. The second floor is similarly appropriated. The work, now nearly completed, comprises about two-thirds of the whole contract, and includes all the various offices and apartments described, with the exception of the north wing and the range of buildings connecting it with the central block. The south wing it is intended to appropriate for boys, and the north wing (now in course of erection) for girls. The building, when finished, will accommodate 500 inmates, exclusive of the staff of officers, and the total cost will not be less than 350,000*l.*

STEAM BOILER EXPLOSIONS.

Sir,—By the programme of the British Association in Liverpool, Mechanical Section, only one paper was, I believe, to be read, viz., "Steam Boiler Explosions." Is it indifference, or are all our wants supplied? Are there no railway accidents to see to? no preventive required for ships turning topsy-turvy? Are explosions in gunpowder mills and coal-mines of no moment? Are,sir,—but your space in the *Builder* is valuable: I will at once explain my self-acting valve of a large bore, the present safety-valve to remain, though oft the reverse of safe, through inattention or tampering.

I think I can best illustrate my improvement by relating a scene in the engine-room of H.M.S. *Wasp*. The boilers were old and much worn, full power seldom attempted. On one occasion the engineer drew attention to the upheaving of the top plates. A little more steam would have sent us all to Davy Jones's locker. One daring fireman danced on the plates.

The lever of my large gush valve being secured down by a wire drawn across the edge of a steel clip or shears: undue expansion would instantly sever the wire, all the steam would then escape up the chimney. An iron plate on the top, made on purpose to bulge, would make assurance doubly sure. R. T.

P.S. Many mechanics would gladly attend an *all-night* discussion. If the British Association would permit them to take part, explain, read papers, show models: they would esteem it an event for a lifetime.

SASHES AND FRAMES.

Sir,—Having noticed the correspondence in your journal of this and last week headed "Sashes," in which objections are urged against them as being continually subject to the breakage of cords, detaching of weights, &c., which renders them comparatively useless, we beg to call your attention to the patent arrangement of which we are the sole manufacturers, which dispenses with the use of lines, pulleys, and weights, and which allows the sashes to revolve, so that the outside of the sash can be turned towards the inside of the room, for the purposes of glazing and cleaning, without removal from the frames or disconnecting beads, &c., which obviates the very objectionable practice of using external stages. This latter qualification cannot be too highly valued.

Archibald Smith & Co.

AYLESBURY SURVEY, AND SURVEYS GENERALLY.

Sir,—In asking you to allow us through your columns to give expression to our astonishment at the acceptance of a Tender of 1871*l.* 10s., we do so on directly opposite grounds to those of your other correspondents, viz., not because a lower tender was not accepted, but that one so low should be.

The work to be done, as per memorandum of instructions sent to the competitors by the Town Clerk, is as follows:—

1. Survey and map of the town, comprising about 200 acres and 1,400 houses, scale one chain to the inch: to be completed by the 1st of November.
2. Survey and map of the district (including a reduction of the town portion), in all about 3,200 acres; scale, three chains to the inch: to be completed by the 1st of February.
3. Separate plot of 200 acres of the country portion (required for irrigation purposes) by 1st of November.
4. Complete schedule of the owners, lessees, and occupiers throughout, with reference numbers on the maps (including, of course, the fair copy of same).
5. Superficial quantity of every field and property throughout, except in the town, where small inclosures may be combined in groups not exceeding 10 poles (includes copying same in schedule or on the maps).

To this add, unless the surveyor reside in Aylesbury, travelling expenses for the staff employed, extra expenses attending their residence, office, &c., with paper for the three maps, and incidental expenses.

We are unable to understand how this can be done with any degree of accuracy for any of those sums quoted in the letters which have appeared, and, knowing nothing whatever of the fortunate (?) competitor, we can only hope that he has not been misled in taking the work at such a figure, and that he will complete it accurately by the times named, so as to obtain a fair profit for the five months' work for the necessary staff; but we cannot conceive the possibility of his doing this unless he succeeds in obtaining the assistance of properly-qualified surveyors at about the rate of ordinary artizans, and we are led to doubt the satisfactory issue so far as the Board are concerned, not, however, unfortunately, so much from the apparent absurdity of such an expectation, as from the opportunities we have had of seeing the result of other surveys made at low prices for local Boards, &c.

A short time since a map of a county town was put into our hands, and on taking actual measurements in the streets, we found that they differed *generally* 8 or 10 per cent. from those appearing on the map. A main road, shown for at least 10 chains, was about 15 degrees out of its true direction, while one of the principal churches had skew angles at all the corners, as apparently the only way of fitting it into the strange shape which the churchyard had (erroneously) assumed.

We could mention the names of other places, some of considerable importance, where the town maps are, for purposes of accuracy and precision, not worth the paper on which they are drawn.

We desire to call attention to this fact, because it is one which does not get generally known. A corporation which, from motives of parsimony, has made a bad bargain in this respect, does not proclaim it, even if aware of it; but a map, perhaps nicely coloured and mounted, hangs in the Town-hall or Board-room, looking, to ordinary spectators, very satisfactory, while a few members of the Board, the town surveyor, and any unfortunate professional men who would be glad, if they could, to make use of it, are alone aware of its worthlessness for nearly every purpose for which it was made.

Hence, if the ratepayers of Aylesbury have cause (as suggested by your correspondent "Fair Play") to regret the acceptance of the present tender, we should base such an anticipation on different grounds from those suggested in his letter; and though the well-known experience of the firm of Messrs. B. Danton would not lead to a belief that they would accept a tender impossible to lead to a satisfactory conclusion in strict accordance with the instructions given the competitors, we cannot but think that they are mistaken in the contrary idea.

We repeat that we know nothing of the gentleman who has taken the contract, but fear he will either find he has undervalued the work, or will have to "cut his coat according to his cloth," in which case either he or the ratepayers must suffer.

We should state, in opposition to the letter of "A Surveyor," that we were distinctly told the lowest tender would not necessarily be accepted, but one according with an estimate prepared by Mr. Denton.

Two of the Competitors.

LAYING PAVEMENTS.

Sir,—Will one of your numerous readers kindly inform me what is the most approved and cheapest method for laying tar paving or asphalte on public thoroughfares?

L. M. F.

THE SEWERS IN REGENT-STREET.

Sir,—Surely something ought to be done to the Regent-street sewers. I have noticed for the last three weeks a most horrible stench rising from the gullies, more especially from those at the corner of Vigo-street.

I think your able sanitary correspondent "Pro" is in more requisition here than in the provinces; for it is a shame that one of our finest streets should become intolerable from faulty drainage. W. H. A.

CASES UNDER THE METROPOLITAN BUILDING ACT.

FEE FOR ARCHES.

At Guildhall, Mr. Wigmore, of Bradfield House, Walham-green, builder, was summoned before Sir Robert W. Carden for 25*l.* 10s. for surveyors' fees for the building of certain arches under the public highway in Newgate Market. Mr. Clarke appeared for the district surveyor, and another solicitor for the defendant.

Mr. Edwin Power said that he was the surveyor for the district which included old Newgate Market. On the 8th of June he received a notice from the defendant that he intended to build fifty-two arches under a public highway in old Newgate Market. He went there on the 12th of June, and measured and surveyed them. About ten or twelve days afterwards he found one or two arches complete. By the 20th of July fifty-one arches were complete, and in the interim he went fifteen or sixteen times to survey them as they were in progress, and had to measure them from time to time to see that the walls were of the proper thickness, the arches of the proper width, and the span constructed according to Act of Parliament. The arches varied in size, and he had to examine every one of them, and measure them. They were not arches attached to houses, but were built on a vacant piece of ground under what was intended to be a public way, and adjoining which houses were intended to be built. Each arch had a separate entrance and party-walls.

Cross-examined.—Each vault or arch was a separate structure, and one arch was turned at a time. He had claimed his fees (25*l.* 10s.), and the defendant had refused to pay them.

For the plaintiff it was contended that each arch was a

separate structure, and entitled him to a fee of 10s. on each; while, for the defence, it was argued that they were one continuous structure, requiring only a fee of 10s. for the whole. After hearing the arguments on both sides,

Sir Robert W. Carden said that while 25*l.* 10s. was too much to pay for the surveyor's fees for the 51 arches, he thought 10s. was too small; but taking the Act of Parliament as it stood he could only order one fee to be paid for the whole of the arches.

Mr. Clarke then asked for a case to go to a superior court, and it was agreed that as the question was one of much importance to builders and district surveyors, a case should be agreed upon to get the decision of a superior court upon it.

THE ALBERT EMBANKMENT.

Sir,—Seldom a complaint has to be repeated in the *Builder*, but really the neglected and dirt-clogged steps from Westminster Bridge to the Albert Embankment are in such a state as to call aloud for a shovel and broom. Provincials will say we are magnificently dirty.

R. T.

MONUMENT IN MEMORY OF DEFOE.

Sir,—I long to suggest an improvement, by way of addition to the above memorial stone. Bald and dry as the bare record is, the by-standers' interest therein would, I think, be greatly increased by the addition of a portrait: an oval medallion likeness, in profile, of the prolific writer, to whom periodical literature in especial, and all successive "rising generations," have been so much indebted.

A. H. Gent.

THE WATER-GATE.

Sir,—In your impression of the 17th ult., I notice a justly indignant letter as to the disgraceful condition of the fine old relic, Inigo Jones's "York Stairs." I entirely sympathise with the remarks of your correspondent, "R. P. W.," and may inform him and the public that when the estimates were made for the new Embankment, it was included to rebuild the Water-gate in an appropriate position. Why this is not executed we can only surmise. Some information from the Metropolitan Board should be forthcoming.

Father Thames.

DISCOVERY IN WORCESTER CATHEDRAL.

As the workmen engaged in laying a new pavement in the Lady Chapel of Worcester Cathedral were removing one of the three stone coffin slabs lying on the floor beneath the great east window, they discovered a stone coffin containing the skeleton of a man, partly enveloped in fragments of the dress in which he had been buried. When Mr. Bloxam, the well-known ecclesiologist, visited the cathedral some years ago, among other things he described to the Archæological Association the three slabs before named, with the effigies upon them. Two of the slabs have apparently no coffins or burials under them. But with regard to the third, which lies north of the other two, and is the one now to be described, Mr. Bloxam believed it to be the earliest episcopal effigy in the cathedral, and it was assigned by him to Bishop William de Blois, who died in 1236, and who laid the foundation of the Lady Chapel and its aisles. The effigy on the slab is sculptured in low relief, and the slab forms the top of the stone coffin in which the remains have been found. On the head of the effigy is the low mitre.

On lifting the slab from the pavement the open coffin appeared, containing the perfect skeleton of a tall man. The coffin had evidently at some former period been rifled of any jewelry or other valuable contents which might have been buried with the deceased. Underneath the head, and forming the cushion on which it lay, was part of a Norman shaft and capital, turned upside down, and hollowed out for the reception of the skull, as was usual in coffins of that period. The coffin had been cut both head and foot, to admit the dead body in its mitre. The coffin is 6 ft. 10½ in. long externally, and 6 ft. 5 in. inside. The skeleton was of a man an inch or two more than 6 ft. high when alive. The sutures of the head were obliterated or ossified, denoting the apparent age from sixty to seventy years.

Mr. Boutell has examined the remains, and given a particular account of them, for which see the *Worcester Herald* of 24th September.

A Public Hall, Camden-road.—It is intended to erect a public hall and reading-rooms in the Camden-road, at a cost of from 3,000*l.* to 4,000*l.* The hall is to accommodate upwards of 500 persons. The architect is Mr. Frederick R. Meeson.

OWEN'S COLLEGE, MANCHESTER.

The foundation-stone of the new building for Owen's College, Manchester of which we gave full details on the 9th of April last (page 281), has been laid on the site which has been purchased in Oxford-street, extending from Coupland-street to Burlington-street. The ceremony was performed by the Duke of Devonshire, in the presence of a large and fashionable gathering, including Professors Huxley and Tyndall, and many other members of the British Association for the Promotion of Science, who had been specially invited. The building was designed by Mr. Waterhouse, the architect of the Manchester Assize Courts and of the new Town-hall, now in course of erection in Albert-square. The style is Gothic. It will have accommodation for 600 day students, and for a much larger number of evening students. A sum of 102,000*l.* has been placed at the disposal of the Building Committee, 67,000*l.* of which are at present available for the erection of the college. The cost of the building now under contract is 90,000*l.*; so that a sum of from 25,000*l.* to 30,000*l.* is still required for building purposes. When completed, the building will form a quadrangle, of which that part of the college which is now in course of erection will form the western side. The principal front of the building will face Oxford-street.

In laying the stone, the Duke of Devonshire remarked that Owen's College owed its foundation to an act of remarkable liberality on the part of one of the successful merchants of Manchester, and its permanent and continued success was, no doubt, largely attributable to the efforts of the citizens of Manchester. Mr. Owen's bequest ought not to be measured by a pecuniary standard, but as an example which had been more fruitful of good than his money. It is understood that the projected buildings will provide ample accommodation for threefold the number of students who are at present receiving instruction in the college.

"SARCOPHAGUS."

Sir,—Will you kindly inform me the proper use of the word "sarcophagus," as applied to tombs?

N.

*** A sarcophagus is the actual receptacle in which the body is placed, as its derivation from the Greek (*sarx*, flesh, and *phago*, I eat), shows.

ARCHITECTS IN RESPECT OF SCIENCE.

At the last meeting of the Northern Architectural Association, Mr. T. Oliver, the president, read an address on the position of architects in regard to science. His object, he said, was to call the attention of the association to a prominent omission and a prominent fact in connexion with the architectural profession, and the development and progress of what was called social science. Not only as a body, but as individuals, architects had hitherto, in his opinion, held themselves aloof from discussing scientific matters, not only to the detriment of science itself, but to their position as scientific men. Architecture, while essentially an art, was also a science. Its practical application incited a knowledge of the science of construction in its ramifications, details, and materials, and in its varied adaptations to the material wants of mankind. He maintained that the architect must be a man of science if he aspired to eminence and public appreciation. Called to lay out towns, plan streets and dwellings, it became absolutely necessary that his scientific qualifications should be brought into requisition, as well as that artistic power which enabled him to clothe a building with the greatest beauty. Architects as a body, he must confess, were both scientifically and practically competent to grapple with all such difficulties, and indeed, in their ordinary practice, really did so. It was, however, a singular circumstance that architects did not take that active part, and apparently that active interest, in purely scientific matters as the members of the medical profession, both collectively and individually, took. On the one hand, the architect was practically conversant with the improvement of unhealthy dwellings, the removal of impure excreta, the improvement of drainage, and the general application of the principles of ventilation, as well as the designing of new streets and dwelling-houses; while, on the other hand, the medical practitioner knew and dealt with practical results rather than with practical scientific remedies. He referred, of course, to the bricks and mortar, and not to the medicinal question, but did not for a moment detract from the influence of the medical man. He pointed out that architects, inasmuch as they had so much to do with the dwellings of the people, were the best persons to assist in remedying the causes of disease in regard to drainage, ventilation, &c.; and he was persuaded that no religion, education, politics, laws, or penalties would so greatly benefit mankind as a healthy and happy home; and how to make this no one knew so well as an architect.

CHURCH-BUILDING NEWS.

Kington (near Hereford).—The new church at Evancoyd has been consecrated. It is from the designs of Mr. T. H. Wyatt, of London, and is in the Gothic style of architecture of the Early Decorated period. The vestry abuts upon the north wall of the chancel, and the general entrance to the church is by a porch on the north side, from which large folding doors open directly into the nave, and a smaller one at the side leads into the aisle. The interior of the church is uniform, the seats, &c., being all of dark stained wood. At each end of the church are large stained-glass windows, the one being erected as a memorial of the late Mr. Higgins Mynors.

Folkestone.—St. Peter's Church, at East Cliff, which has lately been undergoing considerable alterations, has been re-opened. By the extension, seats have been provided for 350 people, in addition to the choir, this being about 150 more than the original building accommodated, and the increase has been effected by the addition of an aisle on the north side. An improvement has been effected in the appearance of the building by increasing the elevation of the roof, and an extension of the chancel and north transept; but the ornamental work is not yet complete. The chancel rises above the level of the floor of the nave, while seats for the choir are ranged on each side, and the vista is terminated by an altar rising some 2 ft. or 3 ft. above the choir, and approached by steps. The stained glass windows, representing various Scriptural subjects, surmount this, and the altar is flanked by two candelabra.

Prittlewell.—The Rev. S. R. Wigram, vicar of Prittlewell, has received subscriptions already amounting to more than 2,000*l.* to enable him to carry out a restoration of the parish church. The church is one of the largest in Essex; but as it has been left in a state of decay, it will require 6,000*l.* for its complete restoration.

Ore (near Hastings).—St. Helen's Church has been consecrated by the Bishop of Chichester. It was found necessary to erect the church on a new site in a more central position, the chief reasons being that on account of the height to which the churchyard had risen round the old walls, and the number of graves against these walls and the vaults, no enlargement could have taken place. The old tower stands and all the ancient parts, and in the tower are collected all the monuments of the past affixed to its walls. The new church has been erected with a lofty tower and spire on a commanding site,—on the top of the hill on St. Helen's estate. The spire is a landmark from the sea, and all the inland country for many miles around. The new church is of the Decorative period of English Gothic architecture. It consists of a nave, side aisles, chancel, tower and spire, and vestry. The accommodation is for about 400. The roof timbers are exposed to view. The building is heated with hot water throughout. There are inner porches to each door to prevent draughts. The church has been erected solely at the expense of the Rev. T. W. Turner, the rector of Ore, who previously built another church at the other end of his parish, also at his own cost. The land on which it is erected was given by Mr. E. Habershon, of Beaulieu, Hastings. The stained-glass east window was given by Bishop Harding, of St. Helen's Lodge, Ore. The architects were Messrs. E. Habershon & Brock, of London; and the builders, Messrs. Hughes, of St. Leonards-on-Sea.

Bristol.—The contract for the first portion of the works connected with the building of the new church of St. Mary's, Tyndall's Park, has been taken by Mr. Diment, of this city, builder, and excavations for the foundation are commenced.

Silloth.—A new church, called Christ Church, has been opened at Silloth. The edifice has

been built by subscription. It is simple in its conformation, consisting of a nave and north and south aisles, with two small transepts or chancel aisles, built in the earlier form of Gothic architecture, freely treated. The north transept forms an organ chamber and vestry, with a cellar underneath for the heating apparatus. The exterior elevations are of Irish granite, which had been brought over to Silloth as ballast to vessels, and the interior is lined with white and red fire-bricks. The nave is surmounted by an open roof of Memel timber, the chancel being close boarded in oak. The nave seats are simple open benches. The chancel fittings are all of oak, with rosewood introduced in portions of the designs. The total length of the church is 94 ft. 6 in., the nave being 63 ft. long, and the apsidal chancel 31 ft. long, both 21 ft. wide. The accommodation provided is for about 500 persons. The church stands in a square by itself, being placed so that one of its longest sides faces the Solway, and on this side inclosing the main entrance door, and forming a porch to it, it is intended to build the tower, a subscription for which purpose has just been opened. The design of the church was selected from a series sent in for competition in April of 1865. The author of the design was Mr. Charles J. Ferguson, then a pupil of Mr. George Gilbert Scott, now of the firm of Cory & Ferguson, of Carlisle, architects. The mason and bricklayer's work was carried out by Mr. Graves, of Aspatria; the carpenter and joiner's work by Mr. Thompson, of Silloth; the plumber's work by Messrs. Thompson; and the painter and glazier's work by Mr. Westray, of Carlisle. The amount expended on the present contracts has been a little under 3,000*l*.

Northampton.—St. James's Church, St. James's-end, Northampton, has been consecrated. The church is in the Early English style, and consists of a nave, south aisle, chancel, south chapel, and vestry. Arches have been thrown in under the clearstory of north wall, to facilitate future extension. The south clearstory is supported by an arcade of four arches, the columns being of polished red granite, with carved caps of Bath stone. The nave clearstory is pierced on each side with twelve lancet-headed windows, formed in groups of three, placed over the crown of each arch. The clearstory is continued along the north and south wall of the chancel. A series of six lights on each side the internal arches, to the chancel windows, are supported by red Mansfield stone shafts, the caps and bases being of Bath stone. The east window is formed of three lights, surmounted by a rose-window, containing nine circles. The south chapel is divided from the chancel by two arches, the central column being of red polished granite, with foliated caps and moulded bases. The chancel walls are ornamented with bands of encaustic tiles. The arch dividing nave from chancel takes the whole span of the central aisle, and is 24 ft. wide. The arch is supported by marble shafts, and terminated with stone and brick corbels. The principal entrance is through a western doorway, above which are two lancet-windows, and the gable is pierced with a quatrefoil opening. The bell-turret, at north-west angle of nave, takes an octagonal form, and is terminated with a spire of Bath stone. The roofs are constructed of deal, stained and varnished. The chancel roof is formed in panels, which are ornamented by means of stencil patterns, applied with a dark stain upon a ground-work of boarding left its natural colour. The mouldings of panel are also stained dark. The nave roof is constructed with beams and king-posts, each rafter being framed alike. The nave and aisles are seated with open benches, of a plain nature. The chancel is furnished with stalls and sub-sellæ, and the altar is approached by five steps, including the foot-pace. The sacrarium floor, as well as the other parts of the chancel, are laid with Minton's tiles. In the south wall, a double sedilia is constructed, divided by a marble shaft. All the walls are built with red brick, both externally and internally, the outside face being varied by the use of bands of local stone, from the Duston quarries. The arches of all doors and windows are also alternated in blocks of local stone and brick. The works have been designed by Mr. R. Wheeler, of Tunbridge Wells, architect; Mr. Ayton acting as clerk of works. The builder was Mr. Kightley, of Northampton, and the carving was executed by Mr. Earp, of Lambeth. The cost of the structure and boundary fences is about 2,700*l*., and the accommodation is for nearly 500.

Upton.—The Church of the Good Shepherd, near Upton, has been consecrated. The site was given by Major Martin. The expenditure has been upwards of 1,300*l*. The design was furnished by Mr. G. Row Clarke; and Mr. Griffiths, of Eldersfield, was the builder. The new edifice contains about 120 sittings. The style is of the Transitional period, from the Early English to the Decorated; length from east to west, 72 ft.; width, 22 ft. 6 in., both inclusive of walls. There are a chancel and nave, but no aisles; a bell gable over the chancel arch; a vestry on the north side of the building, and a porch at the south-west angle; a steep-pitched open wood roof, tiled; trefoil-headed lancet lights in the side walls, and other windows, two and three lights, with Decorated tracery. The chancel arch is pointed, has a roll moulding at the angles, and rests on square chamfered piers, the caps of which are carved with conventional foliage. Similar carving enriches the various corbels and dripstone terminations throughout the building.

Miscellanea.

Lifting Houses.—As the city spreads it is often found desirable to remove buildings in order to raise others more suited to the site. But the old buildings must not be wasted or injured. How can the difficulty be met? It is almost the case of the Irish magistrates who, it is said, passed a resolution to build a new gaol from the materials of the old one; and another resolution that the old gaol should not be pulled down till the new one was ready. Almost, but not quite. The people of Chicago put the old gaol on rollers and take it off elsewhere prisoners and all; so that the new one can be erected on the site of the old, and yet the old gaol not be taken down. I was told of a church, steeple included, which was thus taken from one end of the city to the other. I saw a specimen of house-removal in the town of Buffalo. A wooden dwelling, three stories high, was slowly passing along a street, entirely filling it, the trees of the avenue being injured by the house tearing off many branches on its way. A woman was nursing a baby at an upper window, calmly surveying the scene as she passed along. The method was as follows. A strong rope was fastened to the bottom of the house, and was wound, by a single horse, round a windlass which was planted in the middle of the street. A number of men were at work conveying the rollers from the rear to the front. From time to time the windlass was planted farther up the street as the house advanced. Of course, for the time all other traffic was stopped in the street thus occupied. I was glad to witness for myself what might have seemed an exaggeration. This is a frequent occurrence in Chicago.—*Newman Hall's Journeyings in America.*

Milner's Safes and the British Association.—We have received particulars of some experiments made with Messrs. Thomas Milner & Son's fire and thief resisting safes, at the Phœnix Safe Works, Liverpool. The results of the tests appear satisfactory in every way. In the first instance an ordinary cast-iron safe, without any fire-resisting chambers, and one of Messrs. Milner's ordinary fire-resisting safes, of the weakest quality, were tested in a large fire composed of coal and wood, the result being, after two hours and a half, that the former was entirely destroyed, while the latter remained intact, a 100*l*. note and a large number of circulars which were placed in its interior being wholly untouched. In a second test, one of Messrs. Milner's safes, containing a 100*l*. note, several gold watches, and a number of circulars, was consigned to a terrific fire, in which it remained for five hours and a quarter without any effect of the flames—save a dulness in the colour of the iron—being visible, while the contents were perfectly unharmed.

Birkbeck Literary and Scientific Institution, Southampton Buildings. — This institution has just issued its prospectus for the winter session. The alterations in the class-rooms, which were rendered necessary by the large increase in the number of members, have been completed, and the list of classes has been much extended. Arrangements have also been made by which a course of technical instruction can be obtained. A special course of lectures on the history of art, by Dr. G. G. Zerffi, is announced. These will be illustrated by about 3,000 diagrams, plans, maps, and photographs.

The Metropolitan Asylum at Leavesden. The ceremony of consecration of the chapel and burial-ground, combined with what may be termed the official opening of the new Metropolitan District Asylum for the Imbecile Poor of London, at Leavesden, Woodside, near Watford, has been held. The Leavesden Asylum, of which we have given illustrations, is situated on rising ground about four miles from Watford, and lying between that town and King's Langley. The works have been carried out, and the entire building and fittings, furniture, &c., completed at a cost of 135,570*l*. The buildings are designed to accommodate 1,620 patients—730 males and 890 females. There are on the female side five general blocks, each for 160 patients, 105 ft. by 38 ft., and an infirmary block for sixty patients. On the male side are four blocks for 160 each, and an infirmary block, the whole being connected with covered corridors. The extreme length of the corridors, from the kitchen to the most distant blocks, is 180 yards on the female, and 138 yards on the male, side. The chapel, which will accommodate a congregation of 600 persons, is placed on the left of the administrative block in the frontage. The kitchen, which is fitted with every kind of gas and other apparatus for cooking, is 50 ft. by 45 ft., and 25 ft. high, with thorough ventilation, and large enough to cook for fully 2,000 persons. The day-rooms are each 105 ft. long by 38 ft. wide.

The Moabite Stone.—At the Liverpool meeting of the British Association, the Rev. Dr. Ginsburg read a paper on the "Relation of the Ancient Moabites to Neighbouring Nations, as disclosed in the newly-discovered Moabite Stone." He said that the inscription on the stone read almost like a chapter of the Bible, and when it was borne in mind that this curious relic dated back 900 years before Christ, it would be seen that the inscription was older than two-thirds of the Old Testament. Out of twelve or fifteen Moabite cities mentioned in the Old Testament, eleven were enumerated in that inscription. He had come to the conclusion that at the period indicated an organised temple service existed amongst Jews out of Palestine, and that that service must have been very much akin to the service of the Moabites; that 900 years before Christ the word Jehovah, which was afterwards so much avoided by the Jews, was so much upon the lips of every Jew that it passed over to a neighbouring nation; that the language of the inscription, which was far more simple than two-thirds of the Old Testament, showed that the Moabites had attained to a high state of cultivation; that in military prowess they were superior to the Jews; and that the ancient Greeks and Romans, and we ourselves, had derived what had become our alphabet from them. A discussion followed.

An American Hotel.—On the 25th of August, the doors of the Grand Central Hotel, situate on Broadway and facing Bond-street, New York, were thrown open for the first time. This hotel will accommodate 1,500 guests in its 650 rooms. The superficial area of each floor is over 35,000 square feet, and the top-floor surface dimensions of the interior amount to 350,000 square feet. There are two courts in the centre, 20 ft. wide by 160 ft., affording light and ventilation. These courts are bridged by the main hall on each floor. Fire-hose is conveniently located on each floor, while two large tanks, each holding 10,000 gallons of water, are situate on the top of the hotel. There are five staircases, two elevators, and scuttles to the roof. The building is heated by thirty miles of steam coil. In the statistics of the hotel we find the number of bricks, 4,000,000; cost of building and ground, 1,500,000 dols.; cost of furnishing, 500,000 dols.; water supply in tanks (in gallons), 20,000 dols.; number of doors, 2,000; depth between Broadway and Mercer, 200 ft.; height to top of flagstaff, 197 ft.; length on Broadway, 275 ft.; number of halls, 50; ceilings, average height, 12 ft.; number of stories, 10; acres of carpeting, 7; steam-engines, 3; elevators, 2; acre of marble tiling, 1.

National Association for the Equalisation of Poor-rates.—This association, the president of which is the Lord Mayor, held a committee meeting on Tuesday last at the Westminster Palace Hotel. A letter was read from Lord Alfred Churchill, stating his consent to become one of the vice-presidents; also letters from gentlemen in various parts of the country, approving the objects of the association. The meeting resolved to take vigorous action.

New Railway Stations.—The new stations at present being built in the Midland Counties are rather numerous, and find a fair share of work for the builder, and those more or less interested in the trade. Amongst the largest and most important is the erection of a new Great Western station at Snow-hill, Birmingham. The old structure has been taken down, and in its stead a new brick erection is beginning to make its appearance. The building is to be erected on a scale suitable to the traffic. The London and North-Western are erecting a large goods station at Derby, where a considerable amount of business is done. The building is of brick, and is being erected by a Rugby firm. It is almost ready for roofing. The vast colliery population of Clay Cross and the district has induced the Midland Company to erect a new station. The building is fast approaching completion. A population capable of producing 400,000 tons of coal for London yearly has gathered round the place. A new station is also nearly finished at Chesterfield. The building is composed of pressed fire-bricks, with wooden platforms, the covering being iron and glass. At Unstone a new station has been built, with two platforms, 100 yards in length and 13 ft. broad.

Whitworth Scholarships for 1870.—The award of the ten Whitworth Scholarships of 100*l.* each for the year 1870 has just been made to the undermentioned candidates:—To those examined as students—W. Garnett, 19 years of age, student, London; Jas. Taylor, 21 years of age, mechanic, Oldham; J. A. Griffiths, 22 years of age, engineer student, Middleton; H. W. M'Cann, 17 years of age, student, Liverpool; J. Perry, 20 years of age, engineer, Belfast. To those examined as workmen—Edwd. Tomkins, 24 years of age, engineer and draughtsman, Manchester; Wm. Dodgson, 25 years of age, mechanic, Manchester; Frank Salter, 21 years of age, mechanical engineer, Leamington; W. S. Hall, 25 years of age, engineering draughtsman, Nottingham; Hy. Dyer, 21 years of age, mechanical engineer, Glasgow.

Exhibition of Works of Art for Relief of Widows and Orphans of Germans Killed in the War.—A collection of over 250 works of art, comprising oil and water-colour paintings, prints, photographs, and sculpture, is at present being exhibited at the gallery of the New British Institution, 39, Old Bond-street. All the works contributed are for sale, and many of them will be disposed of by a prize drawing, to take place at the German Academic Society, on the 30th and 31st of December. The committee of this exhibition has made a fatal mistake, which may prevent its being a great success. There should not have been even a suspicion of partisanship in the matter. It should have been organised for the benefit of the widows and orphans of the French as well as the Germans.

Memorial Chapel to Whitefield. — A memorial chapel to the Rev. George Whitefield, the St. Paul of the eighteenth century, as he has been called, is about to be erected in Gloucester, his native city, and within a few yards of the spot whereon tradition says he preached his last sermon in Gloucester. A site at the south-west corner of Barley Close, near the Park, has been selected; the chapel is to be in the Gothic style of architecture, with spire and illuminated clock; provision is to be made for 600 worshippers; the estimated cost is 2,500*l.* Messrs. Medland are the architects. Over the chief entrance is to be a carved representation of Whitefield preaching to a multitude.

TENDERS.

For new male wing to the Hull Borough Lunatic Asylum. Mr. W. Botterill, architect. Quantities supplied:—

Fewster	£1,389	0	0
Brown	1,385	0	0
Goodwin	1,365	12	9½
Habbershaw	1,365	0	0
Hockney & Liggins	1,355	0	0
Walls	1,344	12	0
Halls	1,325	0	0
Lison & Wilkinson	1,322	6	5
Waller	1,281	0	0
Jackson	1,247	14	6
Evington & Wharam	1,245	10	0
Musgrave	1,242	0	0
Marshall	1,240	0	0
Skinner	1,168	0	0
Siminson & Frow	1,167	15	0
Stanley (accepted)	1,162	0	0

For alterations and additions to premises in Crutched Friars. Mr. Joseph Gibson, architect. Quantities supplied:—

Turner (accepted)	£1,134	0	0

For Epsom Cemetery, Buildings, and Mortuary Chapels. Messrs. Shaw & Young, architects:—

Nightingale	£3,362	0	0
Mansfield, Price, & Co.	3,294	0	0
Holland & Hannen	3,288	0	0
Todd & Sanders	3,287	0	0
Hitchcock	3,285	0	0
Peskett & Taylor	3,244	0	0
Batchelor	3,200	0	0
Pritchard	3,179	0	0
Jackson & Shaw	3,160	0	0
Pollard	3,138	0	0
Wright	3,125	0	0
Blackmore & Morley	3,112	0	0
Nye (accepted)	3,078	0	0
Chappell	3,000	0	0
Gibson, Brothers	2,977	0	0
Hemming & Son	2,975	0	0

For building the nave and aisles of the Church of All Souls, Grosvenor Park, Camberwell. Messrs. Henry Jarvis & Son, architects:—

Gammon & Sons	£6,481	0	0
Thompson	5,930	0	0
Dove	5,855	0	0
Myers & Sons	5,746	0	0
Longmire & Burge	5,723	0	0
Henshaw	5,703	0	0

For finishing two houses, with shops, Birkbeck-road, Holloway. Mr. N. E. Jennings, architect:—

Mann	£705	0	0
Nightingale	689	0	0
Faulkner	660	0	0

For national school, Regency-square, Kennington. Mr. C. A. Gould, architect:—

Jackson & Shaw	£749	0	0
Nightingale	733	0	0
Ebrow	728	0	0
Nixon & Son	693	0	0

For St. Simon's Schools, Upper Chelsea:—

Ford	£1,250	0	0
Lacey	1,150	0	0
Nightingale	1,142	0	0
Williamson & Brunt	1,135	0	0
Cowland	1,120	0	0
Steel	1,111	0	0
Goff	1,050	0	0
Parsons & Telling	1,025	0	0
Puttick	1,019	0	0
Whittaker	1,010	0	0
Shillito	955	0	0
Barber & Groom	869	0	0
T. & A. Pearce	867	0	0

For works, 19, James-street, Buckingham-gate. Messrs. Middleton & Goodman, architects:—

Manley & Rogers	£1,377	0	0
Carter & Son	1,357	0	0
Nightingale	1,350	0	0
Scrivener & White	1,309	0	0

For sundry alterations and additions to Sharon Villa, East Sheen, for Mr. Louis Blaise. Mr. John Thomas Wimperis, architect:—

Fish	£1,394	0	0
Adamson & Sons	1,157	0	0
Perkins (accepted)	1,055	0	0

For lining a portion of the Hertford sewers to prevent the ingress of subsoil water. Mr. Thomas W. Grindle, Engineer to the Hertford Corporation:—

Hubbard	£659	0	0
Anderson & Dunmore	525	0	0
Turner & Cole	459	8	0
Dyne	450	10	0
Keeble	450	0	0
R. & W. Andrews	431	5	0
Carter	430	0	0
Bugbird	425	9	0
Strickson (accepted)	404	0	0
Porter	395	0	0

For the erection of boys' and girls' schools, &c., for the district of St. Philip the Evangelist, Arlington-square, Islington. Mr. Alexander D. Gough, architect:—

Cohen	£3,350	0	0
Jackson & Shaw	2,946	0	0
Markwick & Thurgood	2,886	0	0
Crabb & Vaughan	2,842	0	0
Chappel	2,799	0	0
Snowball	2,774	0	0
Potter	2,767	0	0
Wood	2,750	0	0
Colls & Sons	2,723	0	0
Bishop	2,645	0	0
Crockett	2,629	0	0
J. & A. Wright	2,625	15	0
Merrion	2,618	0	0
Hill, Keddell, & Waldram	2,615	0	0
Winship	2,590	0	0
Myers & Sons	2,588	0	0
Newman & Mann	2,586	0	0
Cole	2,575	0	0
Nightingale	2,525	0	0
Heughden	2,495	0	0
Henshaw	2,443	0	0
Blease	2,378	0	0
Gibbs & Son	2,339	0	0
Parsons & Telling	2,235	0	0

For house and two shops, at Wandsworth, for Mr. Diplock. Mr. C. Foulsham, architect. Quantities furnished by Mr. Thomas Nixon:—

Nixon & Son	£1,090	0	0
Colls & Co.	1,075	0	0
Thompson	1,060	0	0
Marsland	1,053	0	0
Taylor & Pitts	1,022	0	0
Taylor	970	0	0
Shillito (too late)	930	0	0

For making alterations and additions to Torrington Lodge, Cleygate, Esher, the property of Mr. H. T. Edwards. Mr. F. Allen Edwards, architect:—

Williams & Son	£1,083	0	0
Stephens	974	10	0
Chessum	950	0	0
Whittick	895	0	0

For new Foresters' Hall, Wilderness-row. Quantities by Messrs. Lansdown & Pollard:—

		Extra if Malm Facing.		
Nightingale	£7,829	£50	0	0
King & Son	7,700	65	0	0
Higgs	7,653	47	0	0
Crabbe & Vaughan	7,500	120	0	0
London Building Companies	7,370	32	10	0
Eaton & Chapman	7,320	30	0	0
Capps & Ritso	7,176	46	7	6
Winship	7,130	40	0	0
Wicks, Bangs, & Co.	6,989	41	0	0
Henshaw	6,865	45	0	0
Wigmore	6,850	46	7	6
Crockett	6,639	31	0	0
Hoare & Cleland	6,298	149	0	0

For infirmary, &c., Stockwell Orphanage:—

Colls & Sons	£1,588	0	0
Thompson	1,575	0	0
Croker	1,571	0	0
Gibbs & Son	1,546	0	0
Tarrant	1,539	0	0
Hart	1,497	0	0
Nightingale	1,386	0	0
Cullum	1,350	0	0

TO CORRESPONDENTS.

J. N. S. (the "Sash").—W. M. M. (if we received the communications named, an answer was given at the time).—Halifax (there are two: the new one from near Tower-hill).—Messrs. K.—M. & Son.—T. C.—J. K.—W. T.—R. W.—E. B.—C.—J. D.—O.—T. O.—W. O. J.—J. B.—H. H. S.—W. R.—J. W. R.—G. W. S.—W. B.—R. & G.—T. B.—T. N.—E. S.—H. & Son.—F. E.—F. T. M.—C. H.—J. P.—J. D. P.—T. L. D.—J. M. N.—T. H.—M. V. & M.—H. C.—H. L.—J. R.—W. B.—W. H. A.—J. L.—W. J. C.—B. R. N.—J. T. W.—C. B. J.—A. B.—B. L.

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VOL. XXVIII.—No. 1444.

The Revival in Holland.

CONTINUING our notice of the revival of architecture in Holland,* we would point to a very large new church at Velemen, about five miles from Bois-le-Duc, and which, from a distance, presents an imposing appearance. Upon a nearer approach, however, one is disappointed, as some of the detail is very poor. The building consists of a lofty nave and aisles, deep transepts, and a choir, with chevet, and five radiating chapels. At the west end is a lofty tower, crowned with a slate spire; and at the intersection is a *flèche*. The tower and spire are well designed, and the apse is picturesque and well arranged; in fact, the whole exterior of the church is striking, and far from bad. Upon entering the building, however, everything good disappears; for arches, triforium, clearstory, and vaulting are all composed of plaster; and, to make the matter worse, all the mouldings, columns, and so on, are most elaborate and intricate, and all the capitals are adorned with foliage, also executed in plaster. The design really would not be so very bad, were it not carried out in plaster; but nothing can excuse or palliate such a detestable sham. The radiating chapels of the apse, which present a good appearance from the exterior, are built off from the choir, and are, we suppose, used as sacristies. The architect of this most disappointing church is Mr. Van Tolda, of Tilburg, who has also built a large church at Tilburg, where all the faults of the one at Velemen are repeated, without any of its merits.

At Helmond, near Eindhoven, is a large new church, very similar in general outline to that at Velemen, only larger, and far better in detail. We were unable to see the interior of this church, or to learn who was its architect. Between Helmond and Bois-le-Duc is Eindhoven, where Mr. Cuypers has built a really magnificent church; and perhaps it is not too much to say that this is the finest modern church in the Netherlands. When seen from a distance, the two lofty spires and the *flèche* of this church present a most dignified appearance, and make this small town look quite like a cathedral city. This fine church consists of a nave of five bays, two lofty western towers, which become octagonal half-way up, and are crowned with slate spires of dissimilar design. The west front, which is simple and grand, is pierced by a large rose-window and three very bold doorways, the centre one of which is double, and has pierced tracery in the head, and a finely-executed statue of the Madonna and Child against the dividing column. The western gable is formed of a combination of niches and open windows. Each side of the nave has five well-proportioned flying buttresses. The transepts are each two bays deep, and the ends have well-designed rose windows, with a single row of lancets below. The choir has three bays and a chevet, from which project three large hexagonal radiating chapels. The whole church is built of brick both within and without, with all the dressings of dark yellow stone. Over the intersection of the nave and transepts is a lofty and very graceful *flèche* of wood covered with lead. The interior of this church is quite as fine, if not finer than the exterior. It is vaulted throughout in different coloured brick, with stone ribs. The clearstory windows consist each of two simple lancets under a sexfoil rose. The triforium is very original and pretty; it consists of three arched openings over each main arch, the upper portions of which are filled with simple perforated tracery, and the lower portions are filled in with a very conventional imitation of drapery similar to that on the exterior of the west front of Rheims Cathedral. The effect of this portion of the church is singularly happy. The main arches of the nave and choir are well proportioned, and the capitals of the columns are everything that can be desired in the way of carving. The internal effect of the chevet, with its three hexagonal chapels, is very fine, as are also the transepts, each of which contains a chapel and altar. The choir fittings are not yet completed, as there are no stalls, though space has been left for them. The high altar is small, but charmingly designed, as are also the metal candlesticks and other furniture attached to it. The side-screens are of stone and marble. At the back of the high altar is a brass plate, stating the date of the commencement of the church (we think it was 1860 or 1862), and its completion in 1868; also giving the name of the architect, Mr. Cuypers, and his able assistant, Mr. Bolsius (to whom we are indebted for much valuable information with regard to the works of Mr. Cuypers, for which we wish to offer him our thanks).* This church, as we are informed by the inscription above referred to, "was erected under the personal superintendence of Mr. Bolsius," who resided on the spot during the whole time the works were in progress. Not the least beautiful part of this church is the decoration; and here, as at St. James's, Bois-le-Duc, Mr. Cuypers has made large use of positive white; for, although the interior of the church is lined with brick of a warmish buff colour, lines of positive white (which is simply whitewash) mark all the more important divisions of the architecture, and are introduced with great effect between the red and yellow bricks of the vaulting and main arches. Along the sides of the church, and over the altars, are sacred subjects painted upon a white ground in a very severe style. Colour is amply used even upon the stonework, and the decorative painting on the high altar and side screens is harmonious. The stained glass is remarkably good; and here we again see the great brilliancy given by the use of a large quantity of white. In the transept windows the figures of the apostles and prophets are all draped in white, the colour, which is rich and deep, being confined to the borders and backgrounds of the windows, the effect is remarkably good. We regret that our space will not allow us to dwell longer on this remarkable and beautiful church, so with a list of the chief dimensions we will close this description of it. The entire length is 237 ft.; width over transepts, 114 ft.; width of nave and aisles, 71½ ft.; height to vaulting of nave, 71½ ft.,—side aisles, 33 ft.; height of spires, 244 ft.

Not far from Eindhoven is another very large and remarkable church, by Mr. Cuypers, at a place called Vechel. In general arrangement it is somewhat similar to Eindhoven, except that it has only one western tower, and at the east end the chevet has two semi-octagonal radiating chapels, and two triangular ones, and a Lady Chapel of two bays, terminating in an apse projecting from the east end. The nave here, also, has one bay more than at Eindhoven. The church is of even larger dimensions than Eindhoven: they are as follow:—Entire length, 245 ft.; width of nave and aisles, 72 ft. (inside); width of nave, 32 ft.; height to vaulting, 72 ft.; height of tower, 268 ft. The whole of this magnificent church is vaulted in stone, and the columns are of granite. The church contains eight altars, and has in addition a baptismal and a mortuary chapel. The lower portion of the western tower forms a finely-vaulted porch.

Mr. Cuypers's church at Breda has already been described and illustrated in this paper. We now give the dimensions of this church, which we were obliged to omit on the former occasion; they are as follow:—Entire length, 216 ft.; width of nave, 27 ft.; height of nave, 66 ft.; height of lantern tower, 235 ft.

We cannot consider this church such a satisfactory building as either of the former ones we have described: though the effect of the double aisles to the nave is undoubtedly good, yet the great open triforium (which is to be used as a gallery) has a bald and weak appearance, and the clearstory wants dignity; in fact, we cannot help thinking it a pity that Mr. Cuypers has sacrificed his design to the idea of utilising the triforium, which can at best make but an unsatisfactory kind of gallery. Some of the details of this church, and the carving of the capitals, are admirable; and there is some very clever decoration and furniture, as well as one or two interesting *old* pictures. In the sacristy is a fine fourteenth-century remonstrance, which, together with the pictures, originally belonged to the cathedral (now Protestant).

The superb monument in the cathedral to the memory of John of Nassau (fifteenth century) has been carefully restored. The rest of the church is in a most disgraceful condition. The nave alone is used by the Calvinists; and the magnificent choir and transepts are allowed to go to ruin, except for the thick coats of whitewash with which they are bedaubed from time to time.

At Oudenbosch a very large new Roman Catholic Church is being built, from the designs of the same architect. It is in the Romanesque style, built entirely of brick. It consists of a nave and aisles, transepts, and a choir, terminating in a semicircular apse.

The following are the principal dimensions:—Length, 260 ft.; height of nave to ceiling, 65 ft.; height of octagonal lantern over crossing, 220 ft.; width of nave, 40 ft.; nave and aisles, 73 ft.

This church is only carried up as high as the walls of the side aisles; but it promises to be a very solid and striking building, though very plain.

At Rotterdam six new churches are building, or have been recently completed; four of these are Roman Catholic and two Protestant (Calvinist).

The Catholic Church of St. Mary, which is being built, or rather rebuilt, by Mr. Cuypers, will be a fine building when finished. The transept alone, however, is at present completed, and, although good, it is not quite equal to other works we have seen by this architect. When completed, this church will be about 180 ft. long, and will have double aisles, a centre lantern, and two western towers.

The Roman Catholic Church of St. Anthony, recently erected from the designs of Mr. J. Margerij, is, on the whole, a good building. It consists of a nave and aisles, transepts, and an apsidal choir, with a sacristy underneath. Over the crossing is a graceful flèche. The church is built of brick, and vaulted throughout in the same material. We suppose that Mr. Margerij was a pupil of Mr. Cuypers, or we should be inclined to accuse him of plagiarism, as this

* See p. 757, *ante*.

* A portrait of Mr. Cuypers is given in our present Number, p. 806.

church bears such a strong family likeness to portions of Eindhoven and Vechel. Its chief faults are, firstly, the thinness of the columns supporting the triforium arcade; secondly, the arrangement of the chancel over the sacristy; thirdly, the chamfering of the piers at the crossing, which would be too thin without such a treatment, and with it presents a terribly weak appearance; and, lastly, the *horrible* stained glass with which the windows are disfigured. However, on the whole, it is a good church, and if, as we suppose, the architect is a young man, it gives hope of better things in future.

Near to this is a small new Protestant church, of which it is perhaps enough to say that it is impossible to conceive anything more mean, or less suited to the purposes of religious worship.

Not far from this another Roman Catholic church is being built, in a street called "Endragts-laan." It is a Romanesque building, of small size, but great pretensions. It is only about 80 ft. long by 40 ft. wide, and yet it has two western towers, a nave, aisles, with triforium gallery over, supported upon columns of black granite; transepts and apsidal chancel. Were there anything like scale to the building, it would not be bad, but as it stands, it is a mere toy or model. The architect is Mr. Laurens. The other Roman Catholic church is attached to the cemetery; it is also Romanesque, and has the same faults, though in a lesser degree, that exist in the former church.

The other Protestant church to which we referred, is situated near the terminus of the Rotterdam and Amsterdam railway, and is far from being a bad building. In plan it is nearly square. Each side shows a gable, with two wings. At one angle is a tower crowned by a slate spire of very fair design. Each side of the building is pierced with a rose-window, and five long semicircular-headed lights. The style chosen is a kind of modified Romanesque.

The Hague has not distinguished itself in architecture within the last few years. A horrible cast-iron spire, of open tracery work, has been added to the tower of the old church, and an equally bad new church has been erected in a street called Blyenberg. The fine fourteenth-century hall belonging to the Parliament House at the Hague has been badly restored. This is much to be regretted, as this Dutch counterpart of our Westminster Hall is a most valuable example of civil architecture of the Middle Ages, and its great hammer-beam roof is quite unique on the Continent.

If, however, the Hague has been behind hand in the revival of Gothic architecture, the same blame cannot be attached to Amsterdam, where several very fair Gothic churches have been erected. In addition to the Redemptorist Church already described, we must notice that of the Immaculate Conception from the designs of Mr. Cuypers. It is a cruciform building. The west front and western bay of the nave are not yet built, but when completed the church will be about 160 ft. long. There is a singular arrangement in the nave, which has a double triforium one above the other, each one being used as a gallery. The effect here is better than at Breda, but we cannot quite reconcile ourselves to these practical triforia. Here, however, there is great excuse for such an arrangement, as ground is excessively valuable, and it is necessary to accommodate as large a congregation as possible on the smallest possible space. The whole church, including the lower triforum, is vaulted in brick.

Another Roman Catholic church has just been commenced, from the designs of the same architect. When completed, this will be the most important modern church in Holland: it is of grand dimensions, the length being upwards of 300 ft., and the width across the transepts over 150 ft. The choir and transepts will be completed at once, and the nave and aisles, towers, &c., carried on as funds are forthcoming.

At Alkmaar, in North Holland, the same architect (Mr. Cuypers) has erected two important Roman Catholic churches. That dedicated to St. Lawrence is a fine cruciform church, 178 ft. long by 92 ft. 6 in. over the transepts. The tower is only as high as the apex of the nave roof at present, but will eventually be carried up another story and crowned with a spire. The roof of the nave here is a wooden barrel-vault. The choir and aisles are vaulted in brick and stone. There is a good deal of very capital decoration.

The church of St. Dominic is a clever, but rather singular building. It is in plan an irregular square, 117 ft. each way. It is cruciform and has double aisles on either side of the nave, and two small supplementary aisles as well. At the intersection is an octagonal lantern.

Very large and important churches are in course of erection by the same architect at Sneek and Klosterburen, in Friesland, and have been recently completed at Vorder, Jabeek (the latter has an open timber hammer-beam roof), Vlaardingen, Offelt, Dockum, Bodegraven, and Blaauwhuis. The last-named is a very remarkable church, with transepts both at the junction of the choir and at the west end. The length is 150 ft., and the whole church is vaulted.

There are very many more works by Mr. Cuypers which are well worthy of notice, but our space will not allow of our describing them, and a mere list would only be tedious and uninteresting.

We think that our readers will agree, after reading this paper, that the revival of Gothic architecture in Holland is really extraordinary. And when it is taken into consideration that all these large and important churches which we have mentioned or described have been erected within the last twenty years, and are spread over a country less than a third the size of England, and with a whole population not much greater than that of London, we have a good idea of the enthusiasm with which this movement has been taken up by our Dutch neighbours. Nor must we forget the large size of many of these churches, six of those we have described are over 200 ft. long, viz., Amsterdam (building) nearly 300 ft.; Oudenbosch (building), 260 ft.; Vechel (completed), 245 ft.; Eindhoven (completed), 237 ft.; Breda (completed), 216 ft.; and Sneek (building), 210 ft.

We are not aware that any country in Europe (except, perhaps, France) can show such a list of large churches now building, or recently completed.

Of course, these important churches cannot be erected without a large outlay, and that is an additional proof of the great prosperity of the Dutch people, and also of their generosity and liberality. We are informed, upon good authority, that when a church is proposed to be built in Holland, nearly every person in the parish puts on one side a certain portion of his income for so many years, which he regularly subscribes to the building fund of the church. Thus, when a church is commenced, those who undertake the work know within a little what sum of money they can safely depend upon getting for its completion.

We wish we could find some words of praise for the way in which most of the *old* churches in Holland are kept, but unfortunately we cannot. The condition of the ancient churches at Breda, Scheidam, Bergen-op-Zoom, and many others we could name, is a national disgrace. The naves of these buildings alone are used by their present possessors, and the choirs and transepts seem, as far as we can make out, to be devoted to the purposes of drying the linen of the clergyman and his family. At Breda we saw a clothes-line suspended across the transepts, with several articles exposed to view which one is not accustomed to see in a place of worship. We observed the same phenomenon at Bergen-op-Zoom and other places.

The churches of Dortrecht and Gouda form an agreeable exception to this general neglect, and the portions of them not used are kept in a decent condition, and not employed for unworthy purposes.

The Dutch Calvinists might profit by the example of their co-religionists of Scotland or Switzerland, who are beginning to restore and take care of the old churches in their possession (*vide* the cathedrals of Glasgow and Basle). We would suggest to them the propriety of keeping the structural portions of the buildings in good substantial repair, and protecting the sacred edifices from unnecessary and wanton desecration.

TIMBER AND CONSTRUCTION.

One architectural characteristic of the present day is the substitution of iron for various materials used in construction down to the earlier portion of the nineteenth century. The origin of the change was not of an architectural nature. It was neither the destruction of forests, the loss of skill, the sudden discovery of any new material, or property of a material, or any of those changes to which we are accustomed to attribute the previous modifications in the form of Christian architecture. But the seed and principle of the new style is referrible to the fact that, some sixty years after Watt has first learned how to derive motive power from the expansion of water by heat, a colliery labourer succeeded in applying that same power to the propulsion of carriages by land.

With the construction of the Liverpool and Manchester Railway, in 1828 and 1829, an entirely new era was inaugurated. Structural requirements were altered, and the effect of the alteration very soon became evident in monumental form. With an increased facility for the transmission of heavy weights over lines of iron rail, a demand for an improved mode of bridging over rivers, roads, or other openings sprang up. The supply and the manufacture of iron thus received a stimulus, and the iron trade, in its turn, reacted upon the designs of the architect and of the naval constructor, by giving him a material which was virtually a new one. Men of practical mechanical genius first laboured to produce structures of wrought iron of which the expense should be reduced to a minimum. Thus Sir Charles Fox, then a subaltern of Robert Stephenson, designed that simple, inexpensive shed roof, for the Euston-square passenger station, which for some time was the normal type of similar structures. The taste and lavish expenditure of Isambard Kingdom Brunel next produced the Great Western Station at Paddington. The need of bridging the Menai Straits led to the construction of the hollow box girder, and the piercing of London with railways induced the execution of those effective, but hideous bridges the aspect of which so afflicts the man of taste. Soon the displacement of architectural requisites by structural combinations that took no heed of any laws but those of strength spread from the floor to the roof,—from the bridge to the station; and men vied with one another in the erection of the largest, the most unnecessarily costly, and the most hideously unarchitectural forms that the world has yet seen.

The use of iron for railway purposes has crept in, to an extent constantly increasing, in civil buildings. Vast shop and warehouse fronts of iron are filled with plate glass. Permanent exhibition buildings are erected, of that perishable combination of iron, glass, and wood, which may answer, on a small scale, for a conservatory, but which is the most costly style of structure, as far as maintenance goes, of which we have any experience. Connected with the same increased energy in our workshops are the increase in the power of artillery, the improvements in the manufacture of shot, the launching of iron and of steel armoured vessels, and the construction of shields for fortresses, as to which, at the present moment, the art of defence is somewhat ahead of the art of attack.

Concurrently with this substitution of iron for wood, and for other materials, there has been, with very few exceptions, a wanton waste of the forest resources, not only of our own country, but of the entire world. Man has come to regard his early cradle, the forest, as an enemy, instead of as a benefactor. In England the prudent care of our forefathers to watch the growth of our forest trees—to secure a perennial supply of oak for our ships, as well as of yew for our bows, is altogether forgotten. The forest rights of the crown over a district that has been wooded since the time of Julius Cæsar—the forest of Epping,—have been so purposely neglected, that it has needed the very unmistakable expression of public feeling to elicit from the Solicitor-General anything more than a joke upon wolves and bears. The 100,000 acres of forest, under the administration of the Woods and Forests, has been so admirably managed, as to arrive at the result of a rental, at the rate of 3s. 6d. (three shillings and sixpence) per acre. The wooden walls of old England are now so much an affair of the past, that it may be said that we only regard timber as necessary to ornamental landscaps, or as a material for lucifer matches.

It is in this country and its dependencies, and in those of our American descendants, that the laws of Nature as to the clothing of the earth with timber have been the most persistently broken. But we are far from being alone in our folly. To whatever part of the world we turn we see indications that waste and destruction bring their own vengeance in their train. Of the effects produced upon climate by the denudation of the soil there is no room for doubt. To a certain extent the influence of human labour in the thinning of forests is beneficial. But the limits between culture and destruction are rarely maintained. In the year 1816 the

forest came up close to the city of Philadelphia. The Delaware, a mile wide, was then often frozen in a single night. The edge of the forest has receded to a distance of more than thirty miles. The thermometer is now rarely down to zero; the river is hardly ever frozen; nor does snow lie long on the ground. In the forest it lies very long. The increased aridity of Palestine, of Spain, and of the South of France, is well known. In the former case it has been partly caused by the cutting down of the olive, a barbarous incident of warfare, merely forbidden by ancient law. In the last-named country it has been the need of fuel that has led to the denudation of so many districts, and the double evil has ensued, first, that the humidity of the climate has been reduced to a formidable extent; and, secondly, that when rain does fall, in any unusual proportions, the absence of the great natural absorbing power of forest districts allows the entire product of the rainfall to be discharged at once by the natural drainage, thus causing those floods which have proved so formidable in their ravages within the last few years.

The denudation of the forests of England is by no means a new grief. More than 200 years ago Mr. Evelyn complained of the rapid extirpation, "root and branch, of all those goodly forests and woods which our more prudent ancestors left standing for the ornament and service of their country." On the confiscation of the Church lands, in 1536, immense forests were cut down; and during the civil war that commenced a century later, many royal forests, as well as private woods, were entirely swept away. In France there yet exist 2,700,000 acres of State forest, earning a gross revenue of 1,740,000*l.* and a net revenue of 1,240,000*l.* per annum. Bavaria contains nearly 2,000,000 acres of forest; Prussia, upwards of 5,000,000; Austria, no less than 13,000,000 acres, realising an annual export value of 3,000,000*l.* sterling.

In France and in Germany exist schools of forestry in connexion with the service of the State, and men of a superior class of intelligence are carefully trained in these establishments for the scientific management of this important part of the national property.

In Bavaria there is a school of forestry at Aschaffenberg on the Maine. The candidates for admission must have passed good examinations in the higher public schools. The time of training extends over five years, half of which time is devoted to acquiring a practical acquaintance with the condition and the care of the forests of the State. The special scientific course comprises lectures on forestry, management of forests, planting, division of forests into blocks, valuation surveys, rotation of classes of timber, and the due rotation between the maximum yield of a forest and its maintenance in an uninjured condition. Preparation, transport, and sale of forest produce forms another special branch of study. Botany, chemistry, zoology, physiology of plants, climate, and geographical distribution of plants form the natural science division of the course; and mathematics, pure and applied, engineering, surveying, and forest legislation complete the *curriculum*. On passing the final examination, the students are qualified for appointments in the Bavarian forest service.

In France a similar college exists at Nancy, where from thirty to forty students are trained for the service of the State. The service is directed by the "Bureau Central de l'Administration générale des Forêts," and 849 *conservateurs* and *inspecteurs*, having under their orders 3,500 *gardes généraux*, have charge of the public forests of France.

Forest schools are also established at Hanover, Newstadt, Eberswald, near Berlin, Thurant, in Saxony, Eisenach, and other places in countries possessing State forests.

The threatened and very proximate exhaustion of the enormous forests and timber-growing jungles under the British rule in India has led to a tardy attention being paid to this important subject by the Indian Government.

From the report of Dr. Brandis, Inspector General of Forests in India, it appears that the normal average of first-class teak trees in a virgin forest is fourteen per acre. A teak forest at Maulmain, in the hands of the Government, extending over 550 square miles, has been found to contain only three full-grown trees in two acres, while damaged trees and stumps abound.

Forests of the Sâl, or Saul, tree replace those of teak in Central India to the north of the Nerbudda river. A belt of forest, from five to twenty miles wide, extends for a length of 1,500 miles along the foot of the sub-Himalayan range, and up to an elevation of 3,000 ft. The Saul tree grows socially, and by its dark green foliage excludes the growth of other trees; being unlike the teak in this habit of growth. In Oude and Nepal the jungles contain as many as seventy first-class trees per acre, together with from 200 to 300 of all sizes, springing up from seed. The system of letting these forests by contract in annual leases to the highest bidder, while bringing in a positively insignificant return, has had the effect of stripping all the accessible parts of this large district of full-grown trees. Such is the size attained by this noble tree, which, with a specific gravity less than that of oak, possesses from one and a half times to twice the strength of that wood, that the Nepal ferry-boats, used to contain from ten to fifteen men, with horses and cattle, are hollowed out of single logs. The tree takes about 100 years to arrive at this size. The British Sâl forests are computed to cover more than 3,500 square miles, and a rest of forty or fifty years will be requisite to replace this waste of first-class trees which has been so blindly permitted to go on.

From the state of the Sâl forests it may be concluded what is the condition of the supply of teak, a tree which grows so much more sparely in its natural home. In 1822 the forests which the native princes had studiously preserved were thrown open to the public. Within eight years it was discovered that, owing to indiscriminate cutting, teak timber fit for Government purposes was growing scarce, both in Madras and in Bombay. In 1839 Mr. Williams, the dockyard manager, reported, that within twenty-one months 40,000 teak-trees, between 12 in. and 6 in. in diameter, had been floated down by the contractors, whose indiscrimate waste was thus destroying the resources of the future. So great had been the destruction, that in 1842 the Government actually purchased 260 square miles of forest land, for replanting with young teak, for the use of the dockyards. It was found that the expense of thus preparing a single acre of forest nursery was greater than the value of the timber which could be grown on a square mile in 100 years! During the thirty years preceding this futile attempt to repair irreparable waste, the forests of Malabar, Canara, Goojerat, Bombay, Madras, Rajamunduy, Coimbatore, and Cochin, stocked with first-class trees fit to cut, and with an ample supply of young trees in all stages of growth, had been given over to destruction. The contractors took no heed of those who might come after them, and cut everything that came to hand.

During this time the forests of the Rajah of Travancore, under the charge of an English conservator, had yielded a regular revenue, while still containing a full supply of first-class trees. For every ten trees fit to cut, two were left for seed; and for every tree actually felled, ten were planted.

The teak-growing districts of Burmah extend over more than 7,000 square miles of forest. A system of well-devised management has been introduced into this district, in 1860, by the conservator, Dr. Brandis. The forests are divided into six divisions, of upwards of 1,000 square miles each, containing an estimated number of 100,000 trees in each district. The trees are divided into five classes, each individual being allowed a period of twenty-four years in each class, thus making the total life of the tree, from the germination of the seed to the felling of the timber, 120 years. The ordinary average of the forest gave 100 trees of the first, second, and third classes, and 200 of the fourth class, per mile. By cutting, therefore, only eighty of the first class in twenty-four years the forest is uninjured, and in the course of 120 years its stock of timber is entirely replenished.

The specific gravity of green teak is greater than that of water. The dry timber, on the other hand, will float. It is therefore the practice to mark and girdle the trees three years before felling. The tree is killed by the destruction of its bark, and dies *in situ*. When felled it is dragged to the rivers by elephants, and floated down to Rangoon, the Government paying so much a log on its arrival. Under these arrangements the Burmese forests have kept up a good supply of timber without exhaustion, and have ensured an annual profit to the Government of 60,000*l.*, besides providing for the expenses of their own conservation, amounting to more than 30,000*l.* a-year.

No less important than the conservation of our extensive forests, inexhaustible as they may prove under proper management, although readily destructible by the waste which we have been accustomed to allow, or rather to practise, is the introduction to the knowledge of the English builder and manufacturer of those noble and beautiful species of wood of which we command so great a variety. It is incredible to what an extent this part of the subject has been neglected. At the Paris Exhibition of 1867, timber from no less than 3,769 distinct species of trees was collected from forty-five different countries. Of this large number Europe contributed 395 species. Africa yielded only 252, showing that the resources of that large continent were almost virgin. Asia produced 858 species, Oceania 966, and America no less than 1,298.

Among the most notable of these materials for the builder may be mentioned the *Eucalyptus Amygdalina* from Victoria, which attains in the valleys of Dandemony and on the Yarra river the height of 420 ft. Dr. Mueller says that this amazing height is by no means exceptional, and that it is due rather to great rapidity of growth than to extreme age. The "white gum" (*Eucalyptus Stuartiana*) and the "stringy bark" (*Eucalyptus obliqua*), are said to exceed 300 ft. in height, and to cover the plains and more barren mountains of Victoria. From the same vicinity come beautiful ornamental woods. The *Senecio Bedfordii*, a curious striped wood, and the *Banksia serrata*, marked with a pattern like network. Gipps Land produces the *Eucalyptus longifolia*, said to last in the ground for twenty years, and the *Acacia suppositosa*, an elastic wood resembling hickory, and yielding straight spars from 50 ft. to 100 ft. long.

British Guiana produces the "Greenheart" (*Nectandra Rodeii*), called the natives Sipicu, a timber which is remarkable both for its great durability and for its extraordinary strength, which is three times that of oak. Balks of this timber, squaring from 18 in. to 24 in., may be had from 60 ft. to 70 ft. long without a knot. In the same locality, the mora (*Mora excelsa*) attains a majestic height of from 100 ft. to 150 ft. It is so tough that it is sure not to splinter when struck by cannon-shot. Its strength is more than double that of oak, and it is said to be exempt from dry-rot. Of the seven species of timber which form the first class in Lloyd's classification for shipbuilding, oak, which heads the list, seems to be far inferior to the East Indian, the Australian, and the African timber, to which we have referred. The list includes seven species of timber, the ordinary European oak (*Quercus robur*), the live oak of North America (*Quercus virens*), African oak (*Quercus Africana*), teak (*Tectona grandis*), and sal (*Shorea robusta*), from East India; mora (*Mora excelsa*) and greenheart (*Nectandra Rodeii*) from British Guiana, and iron-back (*Eucalyptus*, species not named) from Australia.

It is beyond the limits of our space to describe the varied, mottled, striped, and coloured woods which offer such admirable materials for the artist, whether for furniture, for doors, skirtings and wainscotings, or for inlay work. The use of dyed or stained wood for the latter is rendered unnecessary by the bounty of Nature. From the pure white of satin wood, and of numerous other species, to the full lustrous black of ebony, we can simulate almost any that form the resources of the vegetable world. French Guiana produces a violet wood of extreme beauty, the "Bois violet" (*Copaifera bractata*), and the *Caryocar glabrum*, a splendid yellow timber. Brazil has a red wood fit for any kind of furniture, the "*Echrospermum Balkasarii*," and the *Dalbergia nigra*, a beautiful rosewood. Venezuela has a zebra wood (*Cordia zebra*); Natal produces sneezewood (*Pteroxylon utile*), equal in beauty of grain to the best bird's-eye maple; Canada its white and pencil cedars (*Thuja* and *Juniperus Virginiana*).

It is needless to refer to the economic products of the forests, apart from the actual timber: turpentine, resin, Burgundy pitch from the pine forest of the Lander; cork from the South of France, Corsica, Algeria, Italy, and Spain; gum *animi* from Zanzibar; gum *copal* from Angola and Sierra Leone; gum *acacia* from Senegal and Mogador; gum arabic from different sources; palm, cocoanut, and other vegetable oils; coir and fibre; bark for tanning; osier and bamboo; corozo, or vegetable ivory, and nuts for turners' work (*Phytelephas macrocarpa*) from Ecuador; the vegetable wax of the Carnauba palm (*Corypha cerifera*) from Brazil; caoutchouc, the milky sap of the *Siphonia elastica*, and other elastic gums, as well as logwood (*Hæmatoxylon campechianum*), and other dye woods, from the same rich vege-

table district; bark mat from the bark of the lime, the Russian source of supply for cordage, bags, mats, sandals, bassets, horse-collars, packing-cloths, and other purposes; black and grey moss from Louisiana, used by upholsterers for stuffing; "forest wood" for the same purpose, formed from the needle-like leaves of the pine, essential oil from the same tree, balsam and spice. Such are but a few of what may be called the incidental products of the forest.

Our purpose will have been accomplished if we have succeeded in awakening attention, first to the fact of the invaluable stimulus to art, in all its branches, no less than to civil and naval architecture, that must result from the attainment of a competent knowledge of the vegetable kingdom; and, secondly, of the absolute importance, as a branch of the great profession of which the architect, the engineer, the shipwright, and the surveyor, are alike essential members, of the intelligent study of forestry.

WESTGATE BAY, ISLE OF THANET.

A NEW WATERING-PLACE.

Lately, when speaking of Margate, we mentioned some intended building operations on the west side of the town, and prognosticated a good future for this popular watering-place, if the authorities acted wisely. Still further west, though not far, an entirely new location has been made, which bids fair to become in a very short time a favourite resort. About a mile and a half from Margate there are two fine bays, one of which, marked on the maps Westgate Bay, gives the new place its name. The control of the land, some 500 acres in extent, has come into the hands of Mr. Corbett, of the firm of Corbett & McClymont, of the Redcliffe Estate, Brompton, and with the same energy and clear-headedness which have in a marvellously short space of time covered the latter with good houses, and brought to it a population, this gentleman, with several supporters and friends, has set to work to make Westgate a fine watering-place. About four miles of roads have been completely formed and named, as Cuthbert-road, St. Mildred's-road, Sea-road, Westgate-road, Wilson-road, and Domneva-road; a sea-wall and esplanade are being constructed around the two bays, a certain number of houses have been erected, an hotel is about to be commenced, and the site for a church is marked out. The London, Chatham, and Dover Railway Company, whose line passes through the estate, are naturally greatly interested in its progress, and are, we believe, about to form a station there at once. When we add that arrangements are nearly complete for the erection of gas and water works on the estate, it will be seen that the right steps have been taken, and that the style of the beginning promises well for the end. At present good water is obtained from deep wells in the chalk. Mr. Wigmore, who was the contractor for the roads, is building himself steam saw-mills and other workshops, and will probably aid in covering the land.

On a plot of ground within the estate some houses have been erected with the materials patented by Mr. J. Taylor, his facing bricks with concrete-backing, roof-tiles, and so forth, and within these much ingenuity is exhibited in turning space to account.

The houses built by Mr. Corbett are good sound structures designed by Mr. Beazley: they are detached, and, wisely, a good area of garden ground is allotted to each. Professor Erasmus Wilson, Mr. Spencer Lewin, and others who are known have already located themselves at Westgate, and are interested in its welfare.

The sea-wall and esplanade in progress, to which we have already alluded, are a considerable work. The walk is being formed by cutting down and shelving back the cliff, the wall by blocks of Portland-cement concrete, with granite facing, the top of which will be paved or asphalted with the esplanade. To make the work complete, it should be continued round the headland which occurs between the two bays; and it would then present an unrivalled sea-walk more than a mile in extent. Mr. Birch is the engineer, and Mr. Oakes the resident superintendent.

The views embrace Reculvers on the left, Margate on the right, with Daundelyon, Street (the residence of Mr. Mertens), and Birchington inland. Minster and Canterbury, rich in associations, are handy for drives. While we were on the spot, we were reminded of its connexion with early times by the turning up of part of an oddly-shaped vessel in fictile ware, Mediæval if not Roman. Westgate has certainly many natural advantages, and we shall be surprised if it do not prove attractive first to builders and buyers, and then to the general public. It has the fine air and open sea of this part of the coast, with great quiet, and rural surroundings; and yet a ten minutes' ride, or a twenty minutes' walk, will take those who seek a little life and variety to the gaieties of the Jetty, or to Halls by the Sea. We very cordially wish the pioneers success. There is no time to lose on the part of those who would get ready for next season.

RESTORATION AT THE BRITISH MUSEUM.

All kinds of objects of art are in these days restored,—buildings, statues, paintings, furniture, things large and small, useful and useless, valuable and worthless,—and they are restored or attempted to be restored in all sorts of ways, both by adding to them and taking from them, by cutting away the surface and by painting over it, or covering it up. It is difficult sometimes to discover how most effectually to destroy the artistic value of the original work, and to blot out the impress of the original artist and the marks of his mind and hands. There are not a few things so completely coated over with layers of oil-paint that it is impossible to say what the real substance is of which the object itself, whether building or statue, or chair or table, is made of. This is one method, and we are just now led to think about it from the very singular fact of two of our most notable possessions in London city undergoing a process of restoration in a directly opposite way. We ask our readers' attention to them, for they are well worth a little thoughtful consideration, and show how much there is yet to be examined into and studied. St. Paul's Cathedral is, by way of restoration, covered over and hidden away under four or more thick coats of oil colour or paint, so that it is impossible to say what the building is made of; while the *Greek marbles* from the world-renowned Parthenon or Temple of Minerva, Athens, are as industriously in rapid course of *restoration*, not by covering them over after the model of St. Paul's, but by the directly opposite system of removing, through the aid of powerful chemical agents,—some chlorine mixture, we suppose, for there is nothing else powerful enough,—all the weather marks and evidences of age which time had impressed on the surface of the marble! The simple-minded reader who is new to these profound subjects will therefore at once see that there is more than one way of "restoring" a work of art, and that it depends on the fancy of the restorer how it is best to do the work, and how the restored object shall look when the tremendous feat is accomplished. It would perhaps be a difficult thing to say which is the most precious to Englishman, St. Paul's Cathedral or the Parthenon marbles, and in presence of which two things of beauty he may be said to feel most at home; but of one thing we are certain, that they both of them cost him a vast sum of money, and so he is not a little interested in their *preservation* and careful keeping, and thus that his successors may see them as well as himself. Leaving St. Paul's for the present, let us glance for a moment at the work now going on at the British Museum.

Every reader of the *Builder* knows that pure Carrara marble, when fresh from the quarry, is of the most beautiful snow white; indeed, perhaps among natural substances there is no substance more beautiful and refreshing to eyesight than this pure and spotless marble. When the surface of this marble is cut by the successive and minute cuttings of a fine chisel, the surface of it, without being polished,—and the reader is requested to bear this in mind,—acquires a wonderful *transparency* and depth, which makes this substance so fit for the purposes of the sculptor, and so capable of expressing the form and texture of flesh and muscle. But Carrara marble cannot be kept long in this state, or in its state of pure snow whiteness: after a little time, a few weeks or months, it changes colour, and if left to itself becomes of a fine stone-colour. Now, charming as the pure white of the fresh quarried substance may be, it is for the purpose of sculpture a more appropriate colour, and better for its purpose, when it has passed into pale cream-colour, and thence into pure stone-colour, and we may presume no sculptor would hesitate which to prefer of the two, the pure stone-coloured tint being so much more expressive of the nature and colour of the flesh which it is the aim of the artist to imitate. All this applies to the Carrara marble only. But the Greek marbles in the British Museum are made of the equally celebrated Pentelic marble, which is not, even when fresh from the quarry, pure snow white, as is the Carrara marble, but a fine pale cream or stone colour; and it would seem under a clear sky to have the property of retaining that colour for a great length of time, though growing by slow degrees somewhat darker in hue. Of all the marbles it is the best fitted for the purposes of the sculptor, and acquires under the action of the chisel that fine polish which approximates it to the texture and colour of the living flesh. Phidias certainly could not have had a better substance to go to work on. Thus circumstances seem to have all united together to make up the perfection of Greek sculpture,—the man, the substance used, in texture and colour, and the glorious forms by which he was surrounded,—and in the British Museum we may see, or might have seen, the result of it. But what has been the sad fate of these famous and fortunate works? Why, they must have remained for centuries up in their safe niches in the Temple itself without harm or injury of any kind, until the unfortunate seige of Athens, and the blowing up of a powder magazine destroyed so many of them, and injured so many more. It was reserved for Lord Elgin to lay hands on them, and to cause their removal to England, and their sale to the then Government, and their final deposit in the British Museum, where they now are. Let it be recollected that when first brought to the Museum their *colour* had, perhaps, suffered but little: breakages and flaws there were in all directions, but they were all fairly in the same state as when taken down from the building for which they were cut. Of course they were not totally free from weather and time marks. During the time they have been in the Museum no change has taken place in them, with the solitary exception of their becoming—in this climate unavoidable—slightly darker in colour, no attempt happily having been made to restore them, or make up the deficient and broken parts. But, in an evil hour, it seems to have occurred to some one connected with the Museum that some process of restoration or revival might be advantageously applied to them,—not by the tampering with the *form*, but with the *colour* of them, and the unhappy consequence has been, that now nearly the whole of the slabs from the frieze have been subjected to some process of "cleaning," as it is termed,—in other words, by aid of some powerful chemical, chlorine, or alkali, or acid, these marble slabs, and not a few other things, have been thoroughly soaked, so to speak, in this powerful substance, and subjected to its *dissolving* powers, or powers of eating away the substance of the marble. By this process the polish produced by the chisel is almost totally effaced, and the close grain of the marble eaten into and made coarser. It is very difficult to make this marble-cleaning process clear to the mind's eye on paper, but it may be seen clearly enough—nay, but too clearly—in the "Roman Room" of the Museum, in the bust of Marcus Antoninus, where the fact of its having been *washed* is but too painfully evident. It may be also seen in the figure of a Satyr in the next room, close to the doorway. We mention these two objects especially, because the result of washing and cleaning is so strikingly evident, and because, when thus viewed, probably no one is likely to see anything in it but *destruction*,—total destruction, if repeated. The slabs from the Parthenon frieze have been treated in the same way, and the object has evidently been to remove the weather stains, the marks of age, the deepening tint which time always gives, and to make the marble look as if but just newly quarried. But to do this you must go deep into the substance of the marble block, and must remove something in the process, and that something is the fine marble polish and close grain of it, and something, too, and that not a little, of the subtle impress of the hand of the executive artist, and, what is more than all, the peculiar and living flesh-like look of the marble surface always to be found in the genuine and untouched work of all the great artists who have made sculpture the means through which their artistic power has manifested itself. It is very difficult to see how destruction *could* be more complete of exquisitely fine and subtle work. All is not yet gone, though so much is: would it not be advisable to let what remains alone, and to be contented with simple washing with sponge and water? And be it observed that even this operation, simple as it seems, should

be done by a skilful and careful hand, and not by a mere "labourer" or ordinary "attendant." It is truly sad to see how things are going on at the British Museum. It is worth attending to; for the guns of the German army, if firing into the very centre of the great Louvre, will scarcely destroy more effectually than the British Museum system of "cleaning" statues and figures destroys!

But one thing more there yet is which is not only painful to see, but truly absurd, and one would like to know who suggested it. We refer to the system of putting works of marble and sculpture *under glass*, so that you cannot see them except through the medium of the reflections of skylights, your own face, the passing crowd, and the opposite wall. When we come to think that these sculptured slabs of marble have battled so well some 2,500 years of time and weather, and the hand of man, on the top of a high hill, in the middle of a great and famous city, and have yet come down to us with the impress still on them of the sculptor, does it not seem absurd to put them under glass to preserve them from dirt, and an enlightened English crowd in this nineteenth century of education and progress? What harm can come to them if left fairly visible and uncovered, and so that any may see the marble surface and the tool marks of the workman, and the evidences of the marble-cutting powers of the executive artist, of Phidias himself? What a change will take place in art when our influential art societies come to notice such ignorant ways as these, and to so far interfere as to at least protest against them. We are an art-educated and enlightened people, and the result of it is, in a great public institution like the British Museum, to first destroy as far as may be the splendid works of the past, and then to put them under a glass case, so that it is impossible to see them except through the medium of the reflections of an opposite wall or a passing crowd!

HEALTH AND HOUSE-BUILDING.

Returning to our reference to the proceedings at the Newcastle Congress of the Social Science Association, we give a portion of Mr. Rawlinson's address, as president of the Health Department. We will return hereafter to what was said by others with more special reference to Newcastle itself:—

So far as history illustrates or explains anything connected with the past condition of the masses of mankind, the story is one of utter State neglect in securing decent home accommodation. In ancient times the masses were slaves or worse than slaves, as ownership imposed some responsibility, but the free peasant has been for the most part utterly neglected, and was left to house himself as he could. This has been true of the past, and is also true of the present, over the entire surface of the inhabited portion of the world. It is true of country districts, it is also true of towns and cities, however magnificent they may be in their outward appearances. To describe the mud and bog cabins of Ireland, the bothy of Scotland, and the cottage of England, would be to depict nests of foul air, of scrofula, of physical debility, and of moral impurity. The sanitary defects which exist in the lower class dwellings of Great Britain, exist in the lower class dwellings of every nation and people on the face of the earth. There are reports in abundance on English, Scottish, and Irish villages and towns, setting forth the facts in all their hideous details. Single rooms occupied by all the members of a large family, males and females; father, mother, brothers, sisters, and male and female lodgers (sometimes pigs and dogs), mixed in one nest of impurity. Poverty is not always the cause, and, if it were so, should this continue to be a satisfactory excuse? Will sanitary reports, describing the wretched abodes of the teeming populations, or sanitary rules and recommendations left to chance enforcement, avail in enabling the country peasant, or the town artisan, to follow the advice given? If the work of the State stops with reporting and recommending, may not its action be termed "a delusion and a snare?" Poverty is recognised by the Poor Law, and property is made to bear the pecuniary burden. Sickness is recognised by private charity; hence the building and support of public hospitals, and charity is thereby made fashionable. Crime is provided for in the erection of gaols; and the maintenance of legal tribunals, and of punishment, becomes the work and cost of the State. These arrangements are, at this moment, the outcome of civilisation in England. Sanitary legislation, it is true, commenced in 1848, and Act upon Act has since been piled up, one to mend the other, until confusion is the result. Men, "learned in the law," cannot even understand, and of course cannot interpret, these Acts. A Royal Commission, under the chairmanship of Sir Charles B. Adderley, M.P., has been taking evidence relative to sanitary law, and is expected to make a report, with recommendations, in time for the Legislature, in 1871. Whether Parliament will provide any practical remedy for improving human dwellings remains to be seen. Poverty of the occupant is a plea which may be put forth by the peasant in the country, and also by the labourer in the town, and which cannot be gainsaid. The unaided poor cannot provide their places of residence, but must exist in such as they find; the poverty of the individual is, therefore, an effectual bar to improvement by him,—he must take his health and his morals as provided for him by others. If born with an unsound constitution, poor-law taxation will, however, keep him. If example inculcates crime, he will oscillate in and out of gaol. The worst of the males learn crime, and live by it. The most tempted of the female portion of such families drift into prostitution. The wealth of the State is not saved by this mal-arrangement, a fact which has been explained over and over again. Defective house accommodation produces disease, immorality, pauperism, and crime from generation to generation, until vice has become a second nature, and morality virtue, truth, and honesty are, to human beings so debased, mere names. The money expended in relieving pauperism, in detecting and in punishing crime, and in supporting the sick, if properly expended, would provide sufficient funds to furnish improved house accommodation. Taking floor areas and cubic space into account, and the money expended within such spaces, it will be found that wretched dens of misery and vice are more costly to the community than any equal area and cubic space in a palace. There are tenements by hundreds of thousands which generate sickness, pauperism, and crime, the cost of which is paid for out of rates, and yet such property is not worth more than from three to five years' purchase; but the round of degradation is allowed to go on. Zymotic diseases cut down the head of a family. Typhus removes a father in the prime of life, and the family is then left to the care of the parish. "Once a pauper always a pauper" has become a proverb. Statesmen have, therefore, this lesson to learn,—namely, that that which is necessary to the well-being of society, and which individuals cannot provide, but which States can provide, must be the bounden duty of the State to furnish. No excuse can be valid. It does not follow, as an inference from these arguments, that States must build and own cottage tenements; but it may be inferred that States ought to frame laws, and provide means and machinery for enforcing such laws and regulations as are necessary to bring about the required improvements. State aid has been and is afforded in many forms, but upon no defined or settled principles. There are Exchequer Loan Commissioners, who, however, are only State hybrids—they are not a Government department, neither are they independent, but, being in connexion with the Chancellor of the Exchequer, they can advance State money on loan for various purposes. Parliament also by fits and starts votes money for public purposes outside strict Government requirements—as to relieve the Irish Famine, 1846-7; to drain agricultural land; to promote special occupations, as fisheries; to construct roads, canals, harbours, and river improvements; and to provide for the execution of sanitary works, as in Lancashire during the cotton famine. Corporations and local boards can also borrow money from Government for main sewering, waterworks, and general improvements; but not on any simple, easy, and equal principle, and the rates of interest charged vary from 3 per cent. to 5 per cent.; also Exchequer loans are, as a rule, discouraged. The question may be asked, Should the State halt and stop on the threshold of so wise an arrangement as lending money to aid sanitary improvements? The money (1,750,000*l.*) lent to the distressed cotton district (1863-69) has been expended on works of a permanent and sanitary character; such as main sewers, house drains, forming streets and roads, constructing waterworks, and other works of local improvement, thereby securing to the inhabitants means to enjoy health, comfort, and greater facilities for locomotion and trade. The advance of this money relieved local distress, at no cost to the State, because the local rates are mortgaged as security, and both the principal and interest (at 3½ per cent.) will be repaid to the uttermost farthing, "within a period not exceeding thirty years." If Government would lend money at this rate of interest to enable parish authorities, town councils, local boards, improvement commissioners, and other similar public bodies, to improve dwelling-houses, to sewer, drain, construct waterworks, markets, &c., and to effect street, road, and other town improvements, the progress of the whole country in sanitary improvements would be rapid, and the Registral-General would soon be enabled to record the beneficial results in his returns; pauperism would cease its alarming growth, and crime would be lessened. The first steps in sanitary progress are, as previously indicated, special examinations and faithful reports; and then remedial measures ought to follow. The inspections and reports in England have (to some extent) been followed by works, and, at the present time, the Local Government Act (1858) has been adopted in some 700 places, and the number is being added to. A sum of about 8,000,000*l.* sterling (exclusive of the metropolis) has been expended on the various works provided for by the powers of the Act, such as sewering, draining, water supply, road and street improvements, &c. To put the whole of England in a similar sanitary state will cost about 50,000,000*l.* in addition. In round numbers, the sum of 2*l.* to 3*l.* sterling per head of the populations under the Act may have been expended. Large as these figures appear when thus stated, the expenditure is (and will be) a relief and not a burden. House property is (and will be) increased in value, and, in so far as causes producing zymotic diseases are removed, the ratepayers enjoy better health, earn fuller wages, and are, consequently, better enabled to pay the rents demanded. There are many persons, however, who do not appear to value health, if providing the means to obtain it touch their pockets. These persons in towns and villages are, small shopkeepers (in business or retired), small speculative builders, and owners of cottage property, generally owners of those of the worst class, which, on account of their badness, are relieved from paying rates, but in which fever and pauperism are manufactured with singular regularity, the parish relieving officer indirectly, but nevertheless regularly, paying the rents. Since the Crimean war, and the effective work of the Army Sanitary Commission, there have been commissions, inquiries, and reports, as to barracks and hospitals on home stations, and works have been carried out of sewerage, drainage, water supply, and of ventilation, the results being a great reduction in the sick rate, and a reduced annual army death-rate of about 8 in each 1,000.

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In the cities of the Republican States of North America, the worst sanitary defects of the worst cities of Europe are being repeated. The sanitary engineer of the future will know nothing of "refuse matter" other than as a useful product, which, properly applied to the soil, will add to the wealth of the community. The aim and end of statesmanship ought to be to insure to every individual born in the State means of health and of morality. Each Englishman's home should not only be his castle, but his hospital. Charity will not then degrade, but will elevate; and that alone will be true charity which assists the poor to assist themselves, and so to live, independent of almsbegging and almsgiving. We are now proud of our charities, of our public hospitals, which cost 1,000*l.* per bed, plus the additional expenses of administration, in which hospital-beds sick men are treated at a money rate three times greater than the wages they could ever earn when in health. "Our charitable institutions are the glory of our land," but happy will that State be which neither possesses nor needs such form of glory. We repeat at our great musical festival the angelic chant, "Peace on earth, good will to men," but we read in our daily papers of carnage such as the world never before knew; we cannot explain the terrible phenomenon, but stand aghast in dread, fear, and wonder. The war epidemic is upon the nations, and must run its course. Sanitary science under such conditions as are now in existence appears to have laboured in vain. But it is our duty to work in hope and wait. War and carnage are not the end of Christian teaching: we must strive to look beyond the present, and hope for

better times. The poet, using his divine faculty, states,—

"For I dipt into the future, far as human eye could see,
Saw the vision of the world, and all the wonder that would be."

And in another verse the same poet embodies the hopes of men, who believe in revelation and do not despair, in words with which I conclude this address:

"Yet I doubt not thro' the ages one increasing purpose runs,
And the thoughts of men are widen'd with the process of the suns."

SOCIAL SCIENCE IN NEWCASTLE.

Amongst the subjects discussed at the recent congress of the Social Science Association,

The Employment of Children in Brick and Tile Making,

was treated of by Mr. George Smith, of Leicester, who stated his own experience when a child, and continued:—

A sub-inspector of factories informed me the other day that he had visited several brick-yards in the Midlands, and found the children were of various ages, from nine to twelve, but mostly nine to ten. They were of both sexes, and in a half-naked state. Their employment consisted in carrying the damp clay on their heads to the brickmakers, and carrying the made bricks to the "floors" on which they are placed to dry. Their employment lasts thirteen hours daily, during which they traverse a distance of about twenty miles. It may be asked why the inspector did not interfere. He could not, the Act not applying to establishments in which less than fifty persons are employed. Any person visiting these brick-yards will soon discover the need for something being done for the poor little ones. Imagine a child of nine or ten, with features prematurely old, toiling from six in the morning until seven in the evening, and receiving nothing but curses and blows from the men because he is not quick enough in his movements. What s it but actual slavery of the worst description? No wonder many of these children find life a burden to them. Of course, the natural results ensue. Ignorance and immorality prevail to a fearful extent among the workmen and children so employed. How could it be otherwise? All goodness and purity seem to become stamped out of these people; and were I to relate what could be related, the whole country would become sickened and horrified. The employment of girls under the age of eighteen in brick-yards ought to be rendered illegal. The present system is a prolific source of immorality and vicious habits of the worst kind, even more so than the agricultural gang system once prevalent in some of the Midland Counties. Out of the many hundreds of brick-yard girls whose career I have personally marked not more than half a dozen have become decent and respectable wives. If we wish to remedy the evils to which I have,—very slightly, I fear,—alluded, a change must be made in the present system of Government inspection. At present brick-yards, employing less than fifty hands, are exempt from Government supervision. The absurdity of such an arrangement is obvious. In my own neighbourhood there are several brick-yards, one of which, having more than fifty hands, is under Government inspection; the others are not. In the larger yard, a lad of about twelve years of age was prohibited working by the inspecting surgeon: the very next day that lad was to be found employed in one of the smaller brick-yards, and working eighty-four hours in each week. Now, this is the kind of thing we ought to prevent. But a practical solution of the difficulty is to be found. All establishments, no matter how many hands are employed, should be placed under the Factory or Workshop Acts. The former Act should be made to apply to all light trades, in which the half-time system can be adopted; the Workshop Act being applied to those trades in which heavy manual labour is required, and in which the half-time system cannot easily be introduced. Under the present arrangement, it is difficult to tell under which Act an industrial establishment is to be placed.

On the subject of

National Prosperity and Social Security,

Mr. Francis Fuller read a paper. He stated, as a mischievous anomaly, that whilst, by the adequate application of labour to the cultivation of the waste lands in the United Kingdom, such lands could be made to produce, with commercial profit, an annual value of at least 100,000,000*l.* sterling in ordinary articles of food, we pay foreigners in some years nearly 50,000,000*l.* sterling for the very things which could be profitably produced at home. At the same time, hundreds of thousands of people were in distress from want of work, hovering precariously about the narrow lines which separate indigence, pauperism, and crime; and notwithstanding our large imports from abroad, the greater portion even of the employed population were under-fed, and suffering from an insufficiency of the nutritive food which, if the measures advocated by the "Industrial Employment Association" were adopted, would be superabundantly supplied from our own soil. In this plan, Mr. Fuller maintained, would be found a satisfactory solution of the ominously increasing difficulties of the labour question. As connected with that question, he dwelt upon the urgent and imperious necessity of rescuing from ruin of soul and body the multitudes of the young of both sexes who are now growing up in the ways of all evil, to become hereafter the curses and cankers of the body politic. In agricultural pursuits, and the numerous branches of industry which come into operation collaterally with them, and an improved cultivation of the land, existed the only practically inexhaustible field of employment. By this policy the young would be trained to independence, and be enabled to gain a good livelihood at home, or become healthy, vigorous, and prosperous colonists.

The necessity for—

Legislation to prevent Adulteration of Food and Drink,

was urged by Mr. Philip Beavan.

After giving some valuable information as to legislation abroad to prevent adulteration, Mr. Bevan said, any fresh legislation on this subject should be compulsory in its character, and not permissive. All articles of consumption which are manufactured should have their ingredients declared, for there is a feeling prevalent amongst manufacturers, as for instance, cocoa-makers, so that as long as their articles contain nothing hurtful, they are at liberty to call them by the general name of cocoa. Still, a sophistication is, to a certain extent, a fraud, and every purchaser has a right to know what he is purchasing; and although we might be safe in the hands of the largest and most respectable manufacturers, there is a considerable class of unprincipled makers who are not above taking advantage. Differences of opinion sometimes occur as to the relative hurtfulness of certain common adulterants; and an eminent authority has assured me that he had grave doubts as to whether alum was not a good thing instead of a bad one. I would suggest that there should be a Food Sub-department formed, which should take cognisance of all food legislation and supplies. To it a Board of two or three of the most eminent analytical chemists should be attached, who should examine and pronounce upon all disputed chemical questions, and whose opinion should be law. The sub-department should have the election of, and a certain amount of control over, the county and borough analysts, whose appointment should be compulsory and not permissive; neither should it rest with vestries or corporations, many of the members of which are often largely concerned in adulteration. Inspectors should have power to visit and take samples from all dealers in articles of food, subject to certain checks, so as to prevent any risk of tyrannical domiciliary visits. They should also have the power of testing the supplies furnished to public bodies, such as union contracts; for guardians have frequently a habit of accepting tenders for food at a price at which the real article cannot possibly be supplied; as a London Union Board did the other day in the case of butter. In cases where a petty dealer declares his ignorance that the goods which he sells are adulterated, I should make the onus of proving this fall upon him, and then it would be for the Food Sub-department to take the matter up, and prosecute the manufacturer. When adulteration takes place before importation, as in the case of the Malo tea mixture, the department might well provide the machinery for setting consular and other influence to work to prevent it; and might also step in as the proper arbiter between conflicting interests. In this very case, a great fraud on the public was allowed to go unpunished, because the Customs could not legally forego the duty.

As to offences, when proved, I am no believer in either a very small or a very large fine; but I would have no sliding-scale at the option of the magistrate. For the first offence the penalty should be sufficient to make the offender smart in his pocket; for the second, I would double it, and have an *affiche* detailing the offence put outside his door, as also outside the door of the church, police-station, and townhall, for a month. The case should also be advertised in the local papers at the offender's expense. For the third offence there should be imprisonment for one month, with hard labour. Adulteration is either a fraud, or it is not, and it should be punished like any other cheating.

Sewage and Sanitary Works.

Mr. J. Brierley, C.E., of Blackburn, read a paper on "Sewage and Sanitary Works," setting forth the result of his observations, and making a series of suggestions which that experience had given birth to. In laying out a sewerage scheme, he remarked that a close inspection in detail of the whole district was necessary, taking into consideration the population and probable increase, the death-rate, the rateable value past and present, prevalent trades, existing works, amount of rainfall and water-supply, and the geological features of the district. He laid down the following doctrines:—The whole scheme should be laid out, although executed only in sections; main outfalls should be as few as possible; each drainage area should be treated as a separate district; a careful study of the size of sewers would save expense; circular sewers are better than oval up to 2 ft. diameter; to save cost storm outlets should be provided with self-acting overflow; subsoil waters should enter sewers by junctions; the separate system is not generally practical or desirable, because subsoil water and rainfall help to flush the sewers, though excess would reduce irrigation power. Legislation to prevent steam pollution is imperative; transferring solid matter into streams ought at once to be prohibited, but reasonable time should be allowed to intercept all sewage. Sewers should be constructed of earthenware pipes up to 21 inches, above that size of bricks; should be laid down in straight lines, and freely ventilated, to render the gases innocuous. Scavenging and night soil removal should be done by corporations, and not farmed; ash-pits should be covered, and kept dry; excreta and other rubbish should be kept separate, and cleansing must be frequent; water-closets must be provided with an ample flush of water, good ventilation, and efficient drainage. Public water-closets and conveniences might be placed underground in large cities. Each community of 30,000 and upwards should have a medical officer of health; inspectors of nuisances should be intelligent, and large communities should be divided into districts, and furnished with an inspector for every 10,000 inhabitants; the death-rate statistics should be localised, so that disease manufactories might be fixed on, and improved off the face of the earth. Mr. Brierley illustrated his paper by excellent drawings of works carried out in accordance with his theories.

The Labour Market Question.

Mr. E. W. Holland read a paper on the question, "By what means may the labour market throughout England be more equally supplied, with special reference to local and temporary distress?" After describing the difficulties at present experienced both by the employer and employed in meeting with each other, and laying stress upon the helplessness of ordinary labourers in the matter of finding out where work was to be obtained, Mr. Holland went on to recommend the establishment of a national system of labour registration upon a self-supporting basis. He could not advocate, as some persons had done, that the machinery for this purpose should be supplied by the Poor Law, because that would tend to make labourers fall upon the rates for support, and, finding no Governmental agency exactly suited to the work, they came to the conclusion that the Post Office was the best agency that could be at present fixed upon. He looked forward to the day when the Government provident institutions would be extended and erected into a separate department, which would then most suitably undertake the registration of labour. Till that time arrived, the Post-office must keep the labour registers. The registers kept in the various districts should be sent up to the central office, and there compiled into a labour gazette, which would supply the most valuable information as to the state of

the labour market all over the country. A provident travelling fund for workmen should be established in connexion with the registration scheme; and it might be advisable to bring pressure to bear on the railway companies to pass such workmen to their destination at reduced fares. Proceeding to discuss the question how under existing circumstances the workmen's usual difficulty in supplying his means of transport to any given field of labour might be overcome, the writer affirmed that employers in want of hands would usually willingly advance money for their support, provided they were certain of the ability and good character of the men, and could rely upon their remaining at their employment sufficiently long to remunerate their employers for the trouble and expense incurred. He further recommended such a legislative change as would enable boards of guardians, under certain conditions, to migrate labourers who were dependent on the rates for support. One of these conditions was that notice should in all cases be sent to the Union into which the labourers were to be migrated.

FIRE-WARNINGS AND FOREWARNINGS.

London has narrowly escaped what might have been a terrible calamity; and thoughtfully and deliberately, after a careful inspection of the scene of the fire in Shoreditch, we assert this conclusion. Coincident almost, a series of fires has taken place east and west of the City; but amongst the number none present more remarkable features than does the one at Shoreditch. The locality of the calamity is rather low and thickly populated. The streets leading to it and adjoining are narrow, and very many of the houses in the vicinity date back a century and a half. Newcastle-street, as appears from a tablet inserted on one of the houses, dates from 1765; and Old Castle-street—the street where the fire broke out—presents at one end a series of gable-fronted houses, having all the appearance of being raised two hundred years ago. In the immediate vicinity of the timber-yard where the fire broke out, and ranging along Mount-street, the houses are modern, and wretchedly constructed.

The timber-yard was well stocked, as may be inferred even now from the charred *débris*, which rises several feet high. We have often noticed through the City a system pursued by timber-merchants and dealers in sawn timber, which we consider an evil. Many of these timber-yards are very narrow and confined, some of them hardly the breadth of an ordinary house. To compensate for frontage, the plan is resorted to of raising a framework of naked flooring and lofting. The timber is piled, and often it may be seen projecting several feet over the street, as well as rising several feet above the roofs of the houses. This is a common sight, and it may be seen in many back streets and low neighbourhoods. The facilities given to ignition by sparks from chimneys, where thinly sawn wood, almost veneers, are exposed, are apparent. In Shoreditch between twenty and thirty houses have suffered by the fire, the majority of which have been completely gutted of their doors, windows, floors, and roofs. We passed through most of the houses affected by the fire, and, were we drawing up an ordinary newspaper account, we might conjure up many a saddening picture of loss and destruction, of hair-breadth escapes from burning, of household gods, animate and inanimate, reduced to cinder. Birds, rabbits, poultry, and, in one instance, a sterner nature than Sterne's could be furnished with the sight of a poor man's dead donkey to moralise or weep over. The poor tenants of the six houses destroyed in New-street escaped with the exception of two, but lost their all,—their household effects, and their little stock-in-trade. It was lucky, indeed, that the fire did not take place some hours later. Had there been a strong wind the engines that were brought to play upon the fire would have been totally insufficient to stay the destruction. Another timber-yard was just the breadth of the street away from the one where the fire broke out. It narrowly escaped the conflagration; as it stood, it was slightly affected, but happily it was saved. Mild as the night was, portions of the burning mass were drifted a quarter of a mile distant, to High-street, Shoreditch, where the roof of a tavern was set on fire, and to which some of the engines engaged in putting out the first fire had to be draughted. House property, occupying a space of about 200 ft. square, has been injured, and the escape of more appears to us truly wonderful. The poor have lost their all; but it has been lucky indeed, considering the nature of the fire, and the remarkable manner in which it has worked destruction, that Shoreditch has not been completely gutted. The old half- and almost whole-timbered houses that line Bishopsgate-street, and intersect a large portion of Shoreditch and that quarter, are little better than so many powder-magazines or huge boxes of lucifers. Any one can prove the truth of our assertion if he will but visit the scene of the removals that are now going on in Bishopsgate and Shoreditch, to make room for the Great Eastern Railway Extension.

A more complete organisation of the Fire Brigade is wanted. If the City is left depending on a non-effective daytime service, we shall charitably add, May God help the City! There is no reason at all, except that of false economy, to prevent the City from having a complete and active embodiment of force for the daytime as well as the night. The loss of life and property in Liverpool-street is more or less owing to the want of men at the Fire Brigade Station. The help of the public, though acceptable at times, more often proves an incumbrance to disciplined men, who are so prevented from doing their duty. Let us impress it upon the minds of the citizens of London that the fire that was extinguished in the last days of September in Shoreditch, under more adverse circumstances might have swept, with an uncontrollable fury, over a large extent of the east of the City. Let us be warned in time.

THE LAST NEW THEATRE IN THE STRAND.

Observant passengers in the Strand will notice a frontage near the corner of Newcastle-street, marked as the "Opéra Comique," and, knowing the narrowness of the area between the Strand and Holywell-street, will find it difficult to imagine how, even in London, where now-a-days theatres are wedged in among the houses anyhow, an "Opéra Comique" can have been formed there. In truth, however, this doorway is but an approach to an underground way leading across Holywell-street, to a theatre which has been built between that and Wych-street, on a site still so small as to prevent anything like proper stage accommodation, but at any rate larger than was obtainable in the Strand. It backs on "The Globe," and is to a considerable extent underground, as will be understood when we mention that a long flight of stairs in Wych-street leads down to the stage level, and that the pit, of course, is lower than that.

The auditorium promises to be pretty enough, the painted decorations include a considerable amount of figure-painting, Apollo and the Muses, of course, figuring over the proscenium; but we must wait to see it further advanced before we offer any opinion upon its merits. The floor of the house, so to speak, looks as if it were intended wholly for stalls, and has a tier of boxes round it, with a slightly-raised level.

The name is altogether a mistake, unless the building is really intended for French comic operas. Even if it were put into English, it would be too restrictive, or would become absurd.

SETTLED CLAUSES OF CONTRACT.

During the last two years the council of the Institute of British Architects have been in communication with a committee of London builders on two subjects of great importance. 1st. As to "General conditions of contracts," which might be fair to builders as well as to employers. 2nd. As to the habit that some members of the profession had fallen into of having quantities taken out in their own offices, or by a surveyor nominated by themselves, and yet declining any responsibility as to the sufficiency of such quantities. After several meetings an agreement has been come to, which will be found in the following paper:—

"*General Heading for Clauses of Contract, as settled between the Council of the Royal Institute of British Architects and the Committee of the London Builders' Society.*

1. Contractor to provide everything necessary for works as per drawings and specification, or to the true intent and meaning thereof; and if drawings and specification differ, architect to decide which to be followed.

2. Contractor to conform to general acts, regulations, and bye-laws, relating to buildings; to give notices thereby required to be given to local authorities, and pay fees payable thereunder.

3. Contractor to set out works, to rectify errors, provide appliances, and to produce vouchers proving materials to be as described, and genuine, when required. The contractor to provide plant, labour, materials, &c., required. All materials and workmanship to be the best of their several kinds. To leave all perfect and clean.

4. Contractor to keep on ground a competent foreman; and to be supplied with a complete copy of drawings and specification, by the architect or measuring surveyor. Not to sublet without consent.

5. Architect to have at all times access to the works, which are to be entirely under his control. He may require contractor to dismiss any workmen incompetent or misconducting himself, and thereupon the contractor is to do so.

6. Contractor not to deviate from drawings or specification, or execute extra works, unless required to comply with the aforesaid acts and regulations or bye-laws, or unless upon authority of architect, to be shown by written order, or by plan or drawing expressly given and signed, or initialled, as extra or variation, or by subsequent written approval, signed or initialled. Vouchers for all such extras to be delivered to the architect or clerk of works weekly, in case of day-work. No day-work to be admissible unless so ordered, or for work impossible to be measured.

7. Alterations in or additions to works not to vitiate contract, and if no price be agreed, the value thereof to be added to or deducted from contract, according to schedule of prices or fair measure and value.

8. Work and materials brought on ground to be considered property of employer, when included in any paid certificate, and not to be removed without architect's consent; but employer not to be liable for loss or damage thereto.

9. Architect may require such materials to be removed as in his opinion are not according to specification, and others to be substituted; and, in case of delay, the employer may remove same, and substitute others at contractor's cost.

10. Architect may require work in his opinion executed with improper materials or defective workmanship to be re-executed; and, in case of delay, may cause same to be done at contractor's cost.

11. Faults arising from improper or defective workmanship or material within —— months after completion, to be made good by contractor; and, in case of default, employer may recover costs thereof from contractor.

12. Contractor to insure, in office to be approved, in joint names, in half amount of contract, until works covered in, and thenceforth in three-fourths until completion, and to produce policies and receipts for premium. Moneys received to be applied in rebuilding or reparation. In case of neglect, employer may insure, at contractor's cost.

13. Building to be under contractor's sole charge, who is to make good damage by fire, or from causes under his own control; and to hold employer harmless as to injuries to persons and structural damage to property.

14. Employer to have access to building, and may execute other works, for which contractor is to give reasonable facilities, so that his work be not impeded; contractor not to be responsible for damages to or occasioned by such other works.

15. Works (except painting and papering), to be completed in —— months after commencement, unless in case of inclement weather, causes not under the control of contractor, combination of workmen, strike, or lock-out affecting any building trade, in which case architect to extend time, and contractor to complete within such time as the architect shall consider reasonable and in writing appoint. In case of delay, employer to be entitled to £—— per week as damages, if architect shall in writing certify that works could have been reasonably completed in the time appointed.

16. If contractor become bankrupt, compound with or make assignment for benefit of creditors, or suspend or delay the works (except on account of causes mentioned in Clause 15, or on account of proceedings by parties interested in adjoining properties, or for want of proper instructions duly applied for), employer may require works to be proceeded with; and if requisitions be not complied with for —— days, may enter and com-

plete works,—the cost incurred to be repaid by the contractor.

17. Contractor to be paid, on certificate of architect, and at architect's discretion, during the progress of the works, as previously agreed, 80 per cent. of value of works executed, until balance of per centage equal 10 per cent. on contract sum, and thenceforth to be paid full value. When works completed or possession given up, contractor to be paid moiety of balance of moneys payable to him (except £—, for papering and painting), and the remainder —— months from completion of works or giving up possession.

Provided always that no final or other certificate shall cover or relieve the contractor from liability as defined in Clause 11, whether the same be noted at the time or subsequently to granting such certificate or order.

18. Certificate of architect or award of referee showing amount payable to contractor, to be evidence of completion, without prejudice to liability of contractor to make good defects as aforesaid. The sum reserved for painting and papering to be paid to contractor on completion thereof.

19. If employer make default for —— days in payment of any moneys due to contractor, or if works be delayed for —— months by proceedings of adjoining owners, contractor to be at liberty to suspend works, and require payment for works executed, materials wrought up, and loss on goods or materials purchased for the works, and not to be bound to complete contract.

20. Arbitration Clause: with regard to quantity or value of extras and omissions, or variations on the contract, and questions of delay, or the withholding of certificates, or the true intent and meaning of the drawings and specification as to cost,—the arbitrator being an architect and a Fellow of the Royal Institute of British Architects, agreed to by the parties, or appointed by the president (for the time being) of the Royal Institute of British Architects. The arbitrator to award costs between employer and contractor.

Memorandum.—In cases where the quantities are provided, it is recommended that, unless a surveyor be mutually agreed upon by the architect and builder, two surveyors be employed to take off the quantities, one appointed by the architect, and the other by the builder, at a meeting convened for the purpose."

THE NEW MECHANICS' INSTITUTE AND SCHOOL OF SCIENCE AND ART, KEIGHLEY.

This new institute and school, of the design of which, by the architects, Messrs. Lockwood & Mawson, we gave an engraved view and full details in our last volume, pp. 527-9, was formally opened last Friday with a distinguished gathering, and various musical and other ceremonies, followed on Saturday by a *soirée*, and on Monday by a concert.

The edifice is Gothic in style, built entirely of stone, with ashlar quoins and dressings. It stands at the angle formed by the Skipton-road and Cavendish-street, and is a conspicuous addition to the public buildings of the town. The estimated cost was 12,000*l*. The institution is designed as an industrial college for the Keighley district. The building is a very complete one for its purpose, and the educational scheme of the promoters has developed into a still more practical shape since we described its details. The Endowed Schools Commission, on making their inquiry at Keighley in reference to the reorganisation of the grammar-school, were so impressed with the arrangements and general scheme that they decided to turn the grammar-school into a girls' school; hand over the teaching of boys to the new trade-school; and hand over also one-half of the grammar-school income, to be appropriated in the form of scholarships and in other ways that will increase the efficiency of the trade-school. The grammar-school income is but small, and for some time from 100*l*. to 150*l*. a year is as much as can be expected from it; but the arrangement seems a good one.

Of the edifice as built we may give some description. The architectural arrangement has been made subservient to the requirements necessary to unite the large public lecture-hall and the smaller rooms of the Mechanics' Institute. In the grouping of the elevations, advantage has been taken of the different heights and forms of the rooms to produce externally a picturesque effect. The principal front, towards Skipton-road has seven large pointed windows opening into the great lecture-hall. The main entrance is under the tower, which rises to a height of nearly 100 ft., and serves to unite and yet to distinguish the double block of buildings. The Cavendish-street front has gables at each end, with traceried windows and a range of pointed windows between. The centre of this front is relieved by an octagon window terminated by a projecting roof. On the ground or principal floor the institute has the more important rooms, consisting of a reading-room, 28 ft. by 18 ft.; conversation-room 18 ft. by 17 ft.; library, 33 ft. by 18 ft.; news-room at the south-west angle of the building, 33 ft. by 20 ft.; also bank-room, secretary's office, and committee-room. The lecture-hall is 87 ft. by 44 ft. and with a wagon-headed and panelled and boarded ceiling, and will be common both to the institute and school of art. It will seat about 700 persons. On the upper floor the school of art has an exhibition-room, 46 ft. by 22 ft.; mechanical-room, 32 ft. by 22 ft.; painting-room, 30 ft. by 18 ft.; elementary drawing-room, 40 ft. by 18 ft.; also masters' room, ladies' room, and retiring-rooms and lavatories for each sex. The lighting of the painting-room is from the north, and of the exhibition-room from the top. A gallery opens out into the lecture-hall from the landing of the principal staircase, giving accommodation for about 100 persons. The whole of the basement story (which, from the nature of the ground, is clear on all sides) is occupied by a range of class-rooms, eight in number, including one 50 ft. and 18 ft.; a lecture-theatre, 28 ft. by 18 ft.; and a residence for the hall-keeper. Separate entrances from this story are provided. The building is so arranged that the mechanics' institute, the school of art, and the lecture-hall may be in operation at the same time, and yet not interfere with each other. All the rooms are lofty and well ventilated, and are warmed with open fires or hot-water apparatus. The works have been executed by the following tradesmen:—Mr. John Smith, the masonry; Mr. R. Sugden, the joiner's work; Mr. John Schofield, the plumbing and glazing; Mr. B. Dixon, the plastering; Messrs. Clapham, Bros., the ironwork; Mr. T. Wilson, the slating; and Mr. H. Briggs, the painting. The original amount of the contracts was 9,434*l*. 3s. 6d., and including the price of land, the architects' commission, &c., the total cost will be about 13,000*l*.

ARCHES UNDER PUBLIC WAYS.

Sir,—Admitting the dubious language of the "Act of Parliament,"—*lapsus calami*,—I think there can be no doubt as to the intention of the Legislature that this was a special fee of 10*s*. per arch; in fact, it involves a manifest absurdity to assume any other intention, as each arch is a complete structure or building in itself, and I fancy it really cannot be argued that an indefinite number of arches may be erected for 10*s*., and at the same time that the fee for one is 10*s*. —a distinct *non sequitur*. Again, it can hardly be deemed an excessive fee. The lowest fee under the Act for any building or structure, descending to a W.C., is 15*s*. If built as an office-building at the back of a house, as a coal-house, this is the fee to which it would be liable.

A District Surveyor.

THE NEW YORKSHIRE CLUB, YORK.

For two years past a new house has been in course of erection for the Yorkshire Club, near Lendal Bridge, in York. The new structure, which was opened for the accommodation of the members of the club on Tuesday in last week, is a large one. The edifice has been erected in accordance with the drawings and designs of Mr. C. J. Parnell, of London, architect. The architecture is Elizabethan. The portal is supported by polished Aberdeen granite columns, and the building is approached by a flight of steps. The ceiling is lighted by glass domes. The principal hall is of large dimensions, and contains the cloak-room, porter's screen, and the principal staircase, the landings of which are supported by arches and columns. On the ground floor are the dining-room, morning-room, smoking-room, and billiard-room, with lavatories. The staircase leads to the private dining-room, drawing-room, library, and writing-room, with a suitable number of dressing and bath rooms. The serving-room on each floor is supplied with a lift from the cooking kitchen. The superintendence of the building devolved upon Mr. W. Lewis, the clerk of the works during the erection of the club-house, but who is now following the profession of an architect. The contractors were Messrs. Weatherley & Rymer, builders, of this city; and the painting and decorations were executed by Mr. Perfect. Mr. Prudames supplied the gasfittings; the globe ventilating light was by Hammond, of London. The carving was executed by Mr. Ruddock, of London. The plumbers were Messrs. Hodgson; the plasterer, Mr. Rawling; and the bellhanger, Mr. Tryer. Mr. Sanderson supplied the ironmongery furnishing. The kitchen was fitted up by Mr. W. Walker, iron-founder, Walmgate. The principal rooms, which are of large size, have been furnished by Messrs. Howard & Son, of London.

THE DESTROYED CRYPT, LEADENHALL-STREET.

Previous volumes of this journal contain views of the few ancient crypts that are to be found, or were to be found, not long ago, in London, and we have thought it desirable to add to them an illustration of the crypt recently destroyed in the City, from a rough sketch made not long before this occurred. This interesting relic of Old London was situated at the south-east corner of Leadenhall-street, near to the well-known Aldgate pump, and, as some of our readers will remember, was periodically "discovered" by writers in the newspapers and described. The shop, to which it formed the basement, has been removed to increase the width of the approaches here, and the desired level of the new pathway and road was thought to render necessary the destruction of the vaulting. It seems to us regrettable that some other course was not adopted, so that it might have been preserved,—at any rate, in part.

Little is known of its history. In plan the crypt was a parallelogram, being 46 ft. from north to south, by 17 ft. east and west. It was divided into two aisles, as shown in the view, by clustered columns, from the caps of which sprang the vaulting. At the intersections of the groins were bosses, cleverly executed. The arched vaulting was received against the walls on semi-clusters, corresponding with the centre groups. The bases of the columns were about 10 ft. below the surface seen in the view. The opening with the steps led from the street, but the archway on the right communicated with the upper floor by means of a circular staircase. There were large cellars near, but not of the same period.

PROPOSED MONUMENT IN ATHENS TO COMMEMORATE GREEK INDEPENDENCE.

On the anniversary of the declaration of the independence of Greece this year, King George announced his intention to erect a monument to commemorate the event in the Square of Concord, at Athens. And he charged Mr. Ziller, the architect of the Academy, to prepare a design for carrying into effect the project of a monument which his Majesty had formed. This design we now publish.

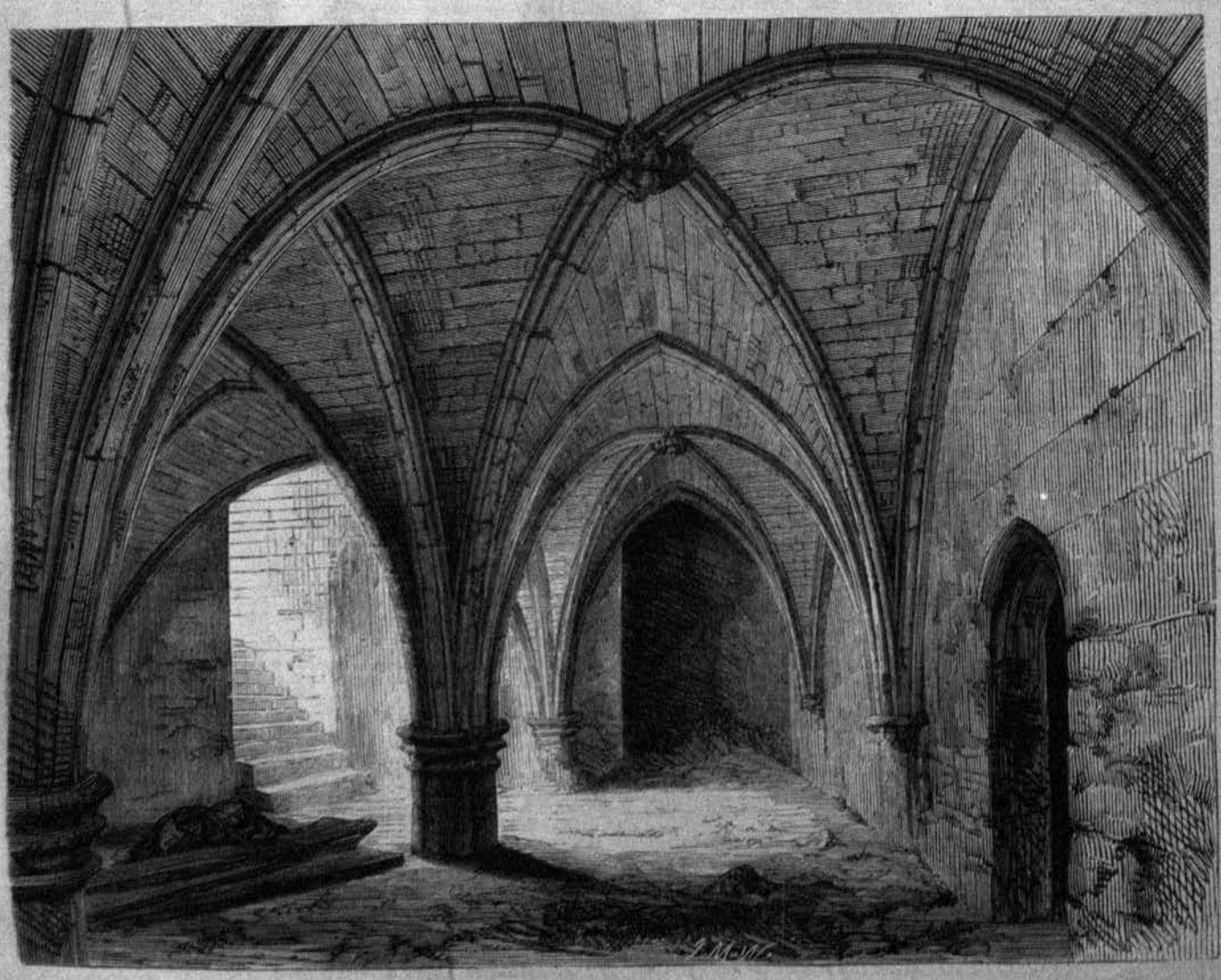
The principal figure on the summit of the monument represents Hellas. The four seated figures on the base represent the four territorial divisions of the Hellenic kingdom,—Northern Greece, Peloponessus, the Archipelago, and the Ionian Islands. The circular frieze round the base is composed of the most memorable scenes of the history of Greek independence. Among these representations are,—Germanos, the archbishop of Patras, raising and blessing the standard of independence on the 25th of March (6th of April), 1821; the siege of Mesolonghi, the battle of Navarino, the arrival of Capodistrias, and the landing of King Otho.

Two inscriptions are placed on the column. "The Nation to its Liberators." "Union gives Strength." The monument will be of pure Pentelic marble, 60 ft. high, occupying a commanding position, visible from the six principal streets of Athens, and at the termination of that which runs in a straight line from the Piræus.

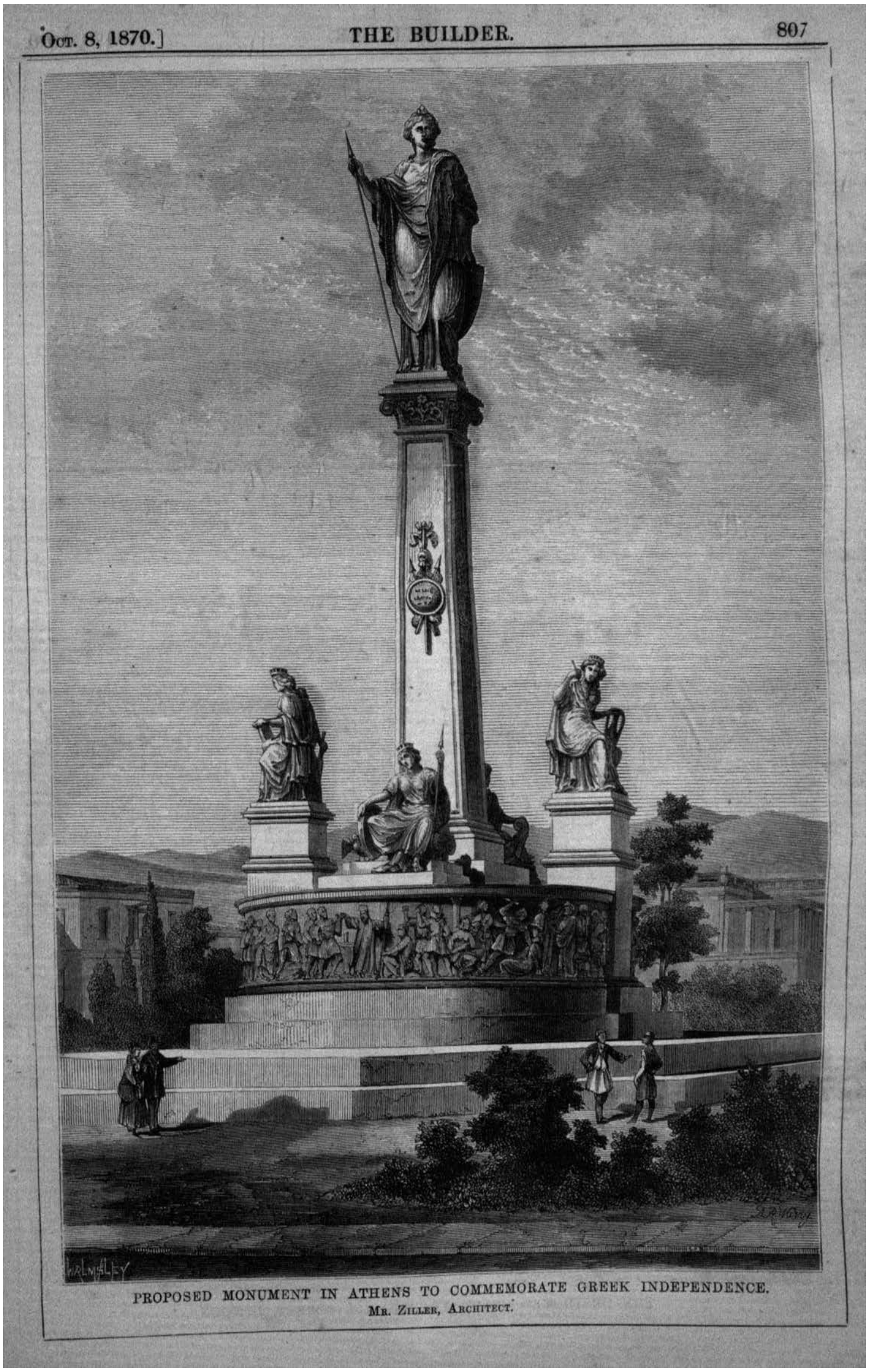
The foundation-stone will be laid next year on the fiftieth anniversary of Greek independence. Invitations will be sent to the Greeks in every part of the world to attend the ceremony, which, it is hoped, will inaugurate a period of future progress as well as commemorate past glory.

The monument is to be raised by subscription, and subscriptions will be received by all the Greek consuls.

MR. CUYPERS, *Architect of many Churches in Holland.*



THE DESTROYED CRYPT, LEADENHALL STREET, LONDON.



PROPOSED MONUMENT IN ATHENS TO COMMEMORATE GREEK INDEPENDENCE.

Mr. Ziller, Architect.

STRASBOURG.

HONNEUR AUX SUISSES!

The horrors of the assault are over. To those only who have experienced the existence in a besieged city can the realisation of the miseries endured be possible. We have listened long to the painful repeatedly-told account from the lips of those who escaped when once escape became practicable, after the commencement of the bombardment that inaugurated the *fête* of Napoleon, of the first sound of missiles whizzing over their heads, like the ascent of rockets,—a whisper compared with the sound that followed of the monster bombshells bursting on roofs, shivering the slates and timbers for 4 ft. in circumference into splinters no larger than lucifer-matches, tearing away in their descent one side of the wall of an apartment, and igniting all around on their landing on the ground. Then came the resorting to the cellars of their houses, carrying their all that was valuable or transportable, barricading every window with beds to dull the din without and protect themselves from the chance balls that might reach them, the staircase forming the only means of ventilation and egress of smoke. Here they awaited some means of rescue or escape from the doomed city. Then, when the increasing fire began at midnight, made doubly awful by the darkness, and the poor sufferers felt as if translated to the infernal regions, escape, at all risks, alone occupied their thoughts. Some few French families accomplished this, with the Germans leaving the town. Their proximity to the German frontier, and the hitherto amicable intercourse between the two people, in this city had almost necessitated the free use of the German language. Hence their escape as Prussians. But the helpless, the aged, the women, and children, these were still left, their lives momentarily endangered, and the prospect of famine before them.

It has been to the Swiss that their deliverance has been due. All honour to the kind-hearted little Republic! A deputation from Zurich, Basle, and Berne petitioned the Prussian and French Governments for permission to enter the city and offer gratuitous hospitality to all who would accept it. And convoys of Strasbourgeois were brought into the principal towns of Switzerland, there to receive unbounded care and kindness. The contributions from every canton have been very large, more than 100,000 francs already subscribed, independent of offers of every kind of hospitality. Not more than 2,000 profited by this generous offer. Many of the most needy remained, preferring at all hazards to cling to their little all, in hopes of saving it at the end, rather than leave it to the invaders; others in hopes of gain when chance of pillage came. The Jews also appear to have remained in their quarter. The accounts of the ruined and battered state of the houses as given by one of the Swiss committee, who entered to escort the refugees, is very heartrending. The sympathy of the Swiss nation for the Strasbourgeois has existed for many a long year. In 1255, they were both Imperial cities, members of the Rhenish League. Their old friendship was renewed in 1456, at a somewhat original trial of skill of archery performed from boats, on the rivers Limmat, Aar, and Rhine. On this occasion the Zurichers, to express the promptitude with which they would come to the help of their friends the Strasbourgeois should they ever need their aid, presented the latter with an iron pot of soup, still hot, that had been cooked at Zurich. The "Marmite" was placed with great ceremony in the Bibliothèque of the town; and, may be, it may still be found intact among the precious embers, a type of indestructible friendship.

In 1530 the towns of Zurich, Berne, and Basle again joined with Strasbourg to protect their Protestantism, in alliance with the Elector of Hesse. In the religious wars of Switzerland in 1529, Strasbourg mediated between the belligerent Catholics and Protestants, and one of the conditions of peace enforced in 1531 was the renunciation of the friendship of the Zurichers and Strasbourgeois.

The good understanding was renewed between the two cities in 1576, by a repetition of the presentation of the "Marmite." In 1584 Zurich and Berne made an alliance, offensive and defensive, with Strasbourg against its bishop. In return, the latter citizens fought bravely with the Swiss in the Burgundian wars, and in the battles of Nancy and Morat. In 1681, when Louis XIV. surprised and annexed the city to France, the Swiss, powerless to aid their friends by arming, strove to aid her by mediation. The custom of international fêtes has continued, and happily been substituted for manifesting the friendly feeling between the two people. But two years since, a miniature copy of the "Marmite" in enamel and gold was presented by the Zurichers to the Museum of Strasbourg. Basle also had received aid in her hour of need from the now distressed city. In 1356 the former had been almost entirely destroyed by an earthquake. The latter not only offered hospitality to the houseless, but gave them still more tangible help by calling on their neighbours of Fribourg, Colmar, and Mulhouse, to aid them in rebuilding the fallen city.

Amid the accumulated horrors of war, this little sketch of enduring kindly feeling and practical tangible friendship between two peoples,—the one reduced by the treachery and incapacity of their rulers to the depths of misery, left alone to struggle through hopeless abasement; the other, peaceful, simple, kindly, coming to their aid, vying with each other in proffers of open-hearted hospitality and sympathy,—may tend further to exhibit the merits and sterling worth of the Swiss.

Lausanne.

OPENING OF THE NEW REREDOS AT HORNCASTLE.

Another of the works lately done in the parish church of Horncastle has been completed, and was unveiled at the Harvest Thanksgiving services. The screen is in Caen stone. It was designed by Mr. C. Giles, of London; and sculptured by Mr. J. Forsyth, also of London. It is in the Perpendicular style of architecture, but of so free a character as to harmonise with the decorated east window. There are five niches; the centre one filled with a representation of Our Lord's Agony in the Garden, the Saviour being accompanied by two angels in *mezzo relievo*, one bearing the symbolic cup, the other ready to place a crown on our Lord's head; over this niche is a canopy ornamented, the whole being surmounted with a cross. The other niches are filled with effigies of the four Evangelists, and between the canopies over them rise enriched pinnacles. Pillars of polished marble of various colours uphold the canopies, and beneath are panels filled with diaper work consisting of escutcheons. We believe it is intended to have the sculpture tinted at some future time.

WEAKNESSES IN THE SEMI-DETACHED VILLA.

Sir,—Is the improvement in the arrangements of the semi-detached villa beyond the resources of architecture? The question arose during a stay in one of the villas near London: villa and suburb both typical. I visited numbers of these erections, and, with the exception of a few details, the arrangements were identical. Judging from the class who live in these villas, and from the frequent adverse criticism on them in current literature, one would conclude that better plans would be appreciated, and, what is of more account to the builders, would *pay*. An infinity of ingenuity has been bestowed on labourers' cottages, while none appears to have been bestowed on small villas, notwithstanding there has been so much demand for it. The villa that has caused these remarks, and which appears to be a type of its class, has a frontage of 25 ft. What is called the ground-floor is more nearly the first floor, being generally about 6 ft. above the ground line; the front and garden steps causing much work, and being dangerous for children. There are generally eight rooms, two on each floor. For this sized house, two reception-rooms, of about 260 ft. superficial, ought to be sufficient accommodation, but we have instead two rooms on this floor of about 12 ft. square. It is true there is generally a small room in the basement called a breakfast-room, but the proportion of three reception-rooms and four bedrooms appears absurd, resulting in there not being *one* reception-room of convenient size. The reason for this is evident, the designers having too much room in the basement for the kitchen and its offices, evade difficulty by calling the spare space they do not know what to do with in the basement "a breakfast-room." In practice I find that plans, that show places where "nice cupboards" can be put, are deficient in compactness. The back garden, usually already small enough, is further filled up at the back with coal-cellars, dust-bin, &c. There ought to be no such depressing objects visible from the back windows, but the garden should come quite up to the back wall of the house. The W.C. is generally placed prominently in the thoroughfare from the living-rooms to the kitchen, and the servants' W.C. is sure to be a nuisance. The pantry is placed anywhere, and without thought as to convenience. The sanitary arrangements are generally of the obscurest.

These are a few of the defects of these dwellings; perhaps if you gave prominence to them in your journal, it might be the means of eliciting some valuable suggestions for their improvement.

Inquirer.

SASHES.

Sir,—I am glad to see that this subject is attracting a little attention. The idea of Mr. Ambrose seems to me to be too complicated, and too expensive for general use; and the inconveniences of the present system suggested by "M. H." are similar to what I pointed out in my letter of the 3rd ult. He needs not wonder why we do not adopt French casements. I have used a good number of them, and I consider them to be equally as troublesome as the ordinary sashes, and quite as liable to let in the wet and draught. The most useful place for them is for ingress and egress from a back parlour to a conservatory or garden of a villa residence. As "G. L." seemed anxious to know the system I would adopt to obviate the inconveniences of the present mode, I will now put it in this form. Supposing a good practical carpenter and joiner should be out of work, or have spare time on his hands (which many have had of late), and who may have saved a few pounds when the trade was brisk, a few years ago, by being a very steady and careful man: he does not like that his time should be utterly lost; so he determines within himself to make a few doors, and sashes, and frames for sale; or he may have the idea at some future time of building a house for himself. He starts making his sashes and frames on the system now in general use,—double-hung sashes, with balance-weights,—and having a pride in making his own, being bound to no order or specification, and knowing the difficulties he has had, or has seen others have, in hanging sashes (in some cases in having to take out the parting slips, to make room for the weights; in others floor-brads or 2¾-in. nails frequently driven into the middle of the linings right in the way of the weights by labourers, in nailing up sacks or hair-bags, to keep out the wind, rain, or frost). These little difficulties he will try and prevent as much as possible. He will take care to give sufficient room to allow his weights free play. It may enter his mind, if he is making them for his own use, "Why need I have any weights?" Various plans may revolve in his mind how they may be hung without them; but all are more or less complicated; and then he thinks there is no necessity for any of these complications. "My sashes," he says to himself, "are of equal size and weight, with the trifling exception of the extra depth of the bottom rail, and as for that, the slight friction will prevent that from being any obstacle. I will make my sashes *suspend each other*; there is no occasion to alter them, and I can also make my frames do; so that I shall get rid of all the little difficulties, without any complications; and as I have observed, when I have been out looking at the various styles of buildings, in about nine cases out of ten the bottom sashes only are opened, the top ones being closed even in bedrooms, so that the foul air is retained in the room, and as I wish to preserve my own health, and also that of my wife and family,—I will hang my sashes on this principle; so that the top sash must be opened the same time as the lower one, so as to get as good ventilation as possible."

I have worked out this idea, and hung my sashes with chains, so that the inconvenience of the weights and broken lines, and of the lines being detached from the weights, is at once disposed of, and it is an excellent system where the top sash is out of reach. The sashes are prepared in the usual way, with holes bored for the lines and knots, in which I insert small bolts with nuts, which screw at the bottom, and hooks to the chain so that they can be regulated to a nicety, and are easily unhooked and removed when required; but although I can hang them almost to a shaving, I prefer a head on the sill and a groove in the bottom rail to fit on it, to prevent heavy driving rain from drifting in, as I have seen it bubbling up between the bottom rail and the inner bead, and running down the wall.

Since I first wrote to you on this subject, I have, during my search after improvements in sliding sash windows, come across one in the Museum of Patents, South Kensington, patented by a Mr. Bullivant, which coincides very nearly with "G. L.'s" idea. It is simple and neat in appearance, and possesses many advantages: dust, draft, and rain are effectually excluded, when closed or open; its construction is such that it cannot be shaken by the wind; it is of even pressure, the contraction and expansion of materials being overcome so that the sashes never require easing, and any unskilled person can remove them for cleaning or any other purpose.

A Working Man.

HER MAJESTY'S OFFICE OF WORKS.

Sir,—I do not blame you for the moderate tone used by you in speaking of recent doings by this department. I know as well as you the exigencies and responsibilities of office, and that men in authority should not hastily be condemned. I think, however, that you have been led by the hasty view you say you had of the Government Terms for architects to take rather too favourable a view of them. They provide that *no rules of the Institute* shall be recognised by the Government,—a wanton and unnecessary insult, which surely the profession ought not quietly to stand. Then the architect is to name the day of completion of the building, which seems to me out of the question. This would be to undertake a builder's risk without a builder's profit. Then the arbitration clause is, as you have pointed out, altogether one-sided. There is nothing to prevent the Treasury from appointing Captain Galton or Mr. Hunt arbitrators in a dispute of their own raising. To show that the latter knows how to take care of his own profession, the surveyors' charges for the new Home and Colonial Offices exceed 6,000*l.*! or 2½ per cent. on the estimate, to be paid out of the first certificate to the surveyors, one of whom is Mr. Hunt's son, who early canvassed the builders, and so was able to get the appointment.* What a satire it is that surveyors should get in cash, and at once, for a few weeks'—say even a few months'—clerical labour, half as much as an architect for his designs, superintendence, and anxieties over several years.

A Tax-Payer.

THE DRAWINGS OF THE HOUSES OF PARLIAMENT.

Sir,—The apparently semi-official communication in yours of the 17th ult., announcing that the law officers of the Crown had declared these drawings to be the property of the Government, and that Mr. Barry would give them up unless supported by the Institute in resisting, deserves serious and immediate consideration. So far as resolutions can go, the Institute has already done enough, and it only now remains at once to open a guarantee or indemnity fund, to which I for one will gladly subscribe, in order that this important question may not be surrendered without, at any rate, a proper and constitutional trial.

I regret very much to notice the pusillanimous and desponding tone of the communication above referred to; and with a view to show that the case is not really so bad as would appear from it, allow me to draw attention to the following considerations:—

The law officers of the Crown are, doubtless, able men, but their opinion is worth little or nothing on this question, formed as it must have been on an *ex parte* statement submitted to them by the Department of Works. Who ever acts on the opinion of an adversary's lawyers? The present Chief Baron, in charging on the recent case, Ebdy v. McGowan, carefully refrained from offering any opinion on this question, and in that showed his wisdom, as it would require very full evidence on professional usage to enable him to form one. I doubt very much whether, if we were permitted to see the opinion of these law officers, it would not be found to be encumbered with so many "ifs," as to make it a mere *brutum fulmen*, wherewith to terrify Mr. Barry and the profession into submission. At any rate, let Mr. Barry's case be properly stated, and laid before two eminent lawyers, of at least equal standing to the aforesaid law officers, and I confidently anticipate an opinion will be given far more clear and decided in his favour than anything that has yet been given against him.

Unless there be something very peculiar and exceptional in the contract between the late Sir Charles Barry and his employers, the question at issue is not one of law at all, but of professional usage, on which the collective opinion of the Institute is of far more value than that of any lawyers, however able. It will have to be left to a jury, and I question much but that the sympathies of such a body are far more likely to be with the architect than with the Government, who must assume the position of plaintiffs, and whose conduct in this whole business is not likely to commend itself to the English love of justice and fair play.

As for its being Mr. Barry's interest to surrender his rights rather than quarrel with a Government from whom he may have to look for future employment, if this principle is to hold good, he may as well work for 4, 3, or 2 per cent. instead of five for the same reason. I believe, however, an architect who knows and maintains his proper professional rights is far more likely to command respect and confidence from either Governments or individuals, than one who is ready to waive them in order to gain further employment. How often do we find lawyers distinguished by the integrity, ability, and success with which they have opposed Governments, selected just on account of this to hold Government offices. Moreover, no one can tell how long the present Government will remain in power, and the present Commissioner of Works does not seem to be so popular either with the public or his colleagues that any cowardly concessions should be made to gain favour with him.

There is one consideration worth notice, and, if it be a valid one, it at once furnishes a complete answer to any action that may be taken by the Government against Mr. Barry, *i.e.*, does not the Statute of Limitations deprive the Government of any right of action to recover any drawings prepared more than six years back? Not being a lawyer, I cannot speak with absolute certainty on this point, but a legal friend advises me that it is so. The late Sir Charles Barry is now dead more than six years, he always considered these drawings as his property, and bequeathed them by his will. The Department of Works put in no claim to them until nearly ten years after, and, therefore, it looks very likely that they are now too late, and that Mr. Barry has simply to plead the Statute of Limitations to silence any action they may threaten him with.

F. R. I. B. A.

* The accepted tender is that of—
Jackson & Shaw £242,323 0 0

ELECTRIC WARFARE.

Sir,—I remember a lecturer informing his audience that he could produce enough electricity to kill them all. A milder dose would only paralyse. This has been tested on whales, and they approve (no,—the whalers approve) of it; capture is made easy.

Now, sir, let us adapt it to stay annihilating warfare. When a ship approaches bent on mischief, let the enemy have a Congreve rocket, with negative and positive wires entwined. Unless the ship is made of a non-conducting material, glass, porcelain, &c., the effect would be certain. Thus, by getting them in a line, we should catch them all alive O! As to forts and fortresses (masculine and feminine, I presume?), why wire into them for the like result?

R. T.

MAN THE BOATS.

Sir,—A portion of my last letter, not printed, because considered unintelligible without diagrams, can perhaps be understood by being explained as follows.

Suppose a block to have six angles and six sheaves; two small ones at one end, and just far enough apart, *i.e.*, their edges, to allow two ropes to pass between them without chafing; then suppose at, say, 8 in. or 10 in. there should be another pair of sheaves, but placed nearer together; so that the two ropes before mentioned could not pass between this pair, but must be placed on their outer edges or grooves (this will separate them); then if, at the other end of the block, a pair of sheaves were placed similarly to the first pair, or so that the ropes could pass between them; then if the ropes were hauled on, they would, in running through this block, be compelled to bear very hard on the centre pair of pulleys (because of their forcing the ropes apart, and consequently out of a straight line). Now, if we could make either one of this centre pair of pulleys always turn its fellow pulley (or sheave) at the same rate that it moves, then when one rope (or fall) should be running over one of these sheaves, the other rope would by the other centre sheave be forced to run at the same rate, and if they were the falls of a boat, then one could not run out faster than the other.

To effect this, make the centre sheaves large in diameter (to increase their power), and screw on to the side of each one a solid iron-toothed wheel; then these two wheels will work into each other, and thus cause the two centre sheaves to move or turn each other, which fully effects our object. The toothed wheels can have places cut out for them in the inside of the shell of the block.

Then in using this as (what I should call a paying-out block) in lowering the boat, it should be hooked by a strap to the bottom of the boat, till the latter has taken the water; then, by using this with the last-mentioned apparatus for casting off the two lower blocks of the tackles, the boat could be lowered almost by the self-action of the said apparatus.

Henry Ambrose.

MARGATE AND ITS CESSPOOLS.

How often have we in this journal spoken deprecatingly of the evils of the cesspool system at Margate; and with how little attention have our warnings been heard. The borough surveyor of that popular watering-place says, in a late report presented to the Town Council upon the subject, "the site of the town is perfectly riddled with cesspools;" and so it is, and we had feared that only on the outbreak of some frightful epidemic, and then with hot and imprudent haste, would the local sanitary authorities consider their ways and be wise. It appears, however, that guided by the intelligence and energy of a local medical man, who has for many years been an ardent sanitary reformer, and who has lately been created an alderman of the borough, Margate is about to awaken from her lethargy upon this most important subject, and to betake herself to "wise counsels" before the question is forced upon her in a manner that admits of no debating; for at a late meeting of the local Board it was resolved that Mr. Bazalgette should be called in to advise with them upon the general question of drainage, with a view to the prompt adoption of such a scheme as may be considered best.

We commend the wisdom of the local Board in procuring the best advice they can get, and we hope that a matter in which Margate can in no way afford to try experiments or make mistakes, may be undertaken with a careful temerity that is entirely opposed to hasty or indiscreet action. The death-rate of the borough, even including the many invalids and the patients of the infirmaries, is only some 13 or 14 per 1,000, notwithstanding all the evils existing. The atmosphere of Margate is remarkably dry, the average rainfall being only just a little above 20 in.; while that of Malvern is 30 in.; Hythe, 32 in.; Sevenoaks, 34 in.; Hastings, 29 in.; and so on.

Margate stands well. Let her rulers look to it that no hesitation to grapple with the important question now before them may place an impediment in the way of her future progress.

COMPETITION.

Matlock.—Designs for restoring the church having been sent in by several architects, Mr. Blomfield, architect, was called in, and reported in favour of the design sent by Mr. B. Wilson, architect, Derwent-chambers, Derby. The other architects competing were Messrs. Wilson & Oldham, Manchester; Mr. Hull, Northampton; and Messrs. Hine & Son, Nottingham.

THE HOLYHEAD BREAKWATER.

This undertaking, which has been in progress for nearly twenty years, is at last in a fair way towards completion. A number of men, amounting to about 200, are now engaged, and are under the orders of Mr. W. Williams, Tanyrefail, the supervisor of the works. The heaps of red sandstone which used formerly to stand untouched at Soldier's Point, have entirely disappeared, and a great call for more is made. The quarries at Holyhead Mountain also resound with the sound of blasting, and stones weighing ten tons and upwards are dislodged at a single blast. The lighthouse at the end has been started, and the work is at present about 6 ft. above the level of the sea. The foundation upon which the lighthouse is to be built, is round on the north and south sides, to the extent of 30 ft. at each end, but goes off square on the east side, where it is 70 ft., confronting the Isle of Anglesey. The lighthouse proper is to be octagonal in shape, but is not to reach to any great height, as it is merely intended to guide vessels entering the harbour. We believe no provision is to be made for the permanent residence of the two light-keepers, as there is no danger of their being kept long at their posts. The stones composing the foundations are hard Anglesey stones, and are embedded in one another with concrete cement. Cement, however, is not the only way in which they are fixed from one stone to another, thus preventing them from shifting. An immense crane, worked by a circular engine, is the means by which these stones, many of them weighing five tons, are placed in their destined position. There is also a number of men employed in shovelling the smaller pieces of stone into large receptacles for the purpose, which are raised by a crane, and deposited on the outer side of the breakwater for the purpose of diminishing the force of the sea. A new steam crane has been erected, and a short line of railway runs into the sea, along which go the wagons laden with the weightier lumps of stone for the embankment or backing, which is to extend about twenty or thirty yards, and is intended to shelter the lighthouse from the greatest violence of the north winds. The extreme length of the wall is about 1¼ mile, and a fine prospect of the Irish Sea is obtained from it. The work is expected to be finished in about two years.

THE INDIAN PUBLIC WORKS DEPARTMENT AND THE CIVIL ENGINEERS IN IT.

Sir,—I had occasion to write to you some time ago, to announce the safe delivery (after a protracted labour) of the mountain (representing the heads of the Public Works Department) of a healthy, though diminutive mouse. I have now to announce a similar occurrence; but, unfortunately, this time the interesting progeny is stillborn.

No sooner had the Institution of Civil Engineers resented the cowardly affront offered to the profession at large by the Indian Government, than the latter issued a circular, informing us all that the whole thing was a mistake, and that so far from underrating the civilians in the Department, Government intended shortly to

place them all on an improved footing, and to make their emoluments, &c., in every way equal to those of the military *employés*. It did not, it is true, endeavour to explain how the former elaborate proofs that the civilians were so much better off had been found wanting. The scheme consisted in raising the pay 60*l.* a year, and making this increased pay the salary of all engineers alike, civil and military, always excepting, of course, the engineer officers, who having the making of the rules, and being liable to be called out for military duty (when, if I am rightly informed, they are allowed to retain their appointments), are to receive an extra allowance as a "retaining fee." The *Pioneer* newspaper, well known to be the Government organ in Upper India, definitely announced that the next *Gazette* was to contain this panacea for all civil grievances: this was in May last, but up to this date not another word has been said about it. To make matters worse, and probably with a view of rendering civil members of the Department still more discontented, some of those who were since last October posted to railways (the new State ones) were granted the increased rate of pay, while it is in contemplation only to apply it to the others from the 1st of April last, and it is now apparently being postponed to save the extra salaries under the pretext of financial pressure. The real probable cause is (and I have heard it from more than one source) that the old colonels and majors in the staff corps, who, after some twenty years' service, find themselves still relatively low down among the executive engineers, have been exercising pressure upon the Indian Government to delay the promulgation of the new rules, as directly they come into force these gentlemen (who draw nearly double the pay of civilians doing the same work) will be practically debarred from all pecuniary promotion.

VOX IN SICCO.

Allahabad.

MONUMENTAL.

Trowbridge Cemetery.—This cemetery contains two new funeral monuments, now near upon completion. One is a mausoleum containing the remains of the late rector and the members of the Kingston family. This building, which is of a semicircular shape, is composed of Box ground stone, and is in the Norman style. The walls are 5 ft. 6 in. in thickness. The exterior is ornamented by zig-zag moulding, supported by polished granite columns with carved caps, with recesses on either side between the columns for mural tablets. The interior is arranged for the reception of eight coffins. The marble slabs in the several chambers at present contain four, that of the late rector and three of the Kingston family. The whole is enclosed by iron rods, supported by pillars of Hanham stone, the interior being approached by steps of the same material. The raised mound is planted with evergreen shrubs. A little distance from this stands another mausoleum, of rectangular shape, in the Early English style, erected by Mr. Rowland Rodway, in which the remains of his son are placed. The exterior is embellished with statues emblematic of Faith and Hope, placed over the entrance, the spandrel being reserved for a figure of the Saviour holding a globe in his hand, with the inscription, "I am the resurrection and the life." Over the doors, which are of oak, ornamented by wrought-iron hinges, run the words, "Hid with Christ in God," carved in stone. Zig-zag moulding runs round the front and sides of the building, the front being supported by pillars of polished Aberdeen granite, with carved caps. The interior is arranged for six coffins, on tables of encaustic tiles. The floors are of the same material, polished. Right and left are sedilia or seats for the mourners, supported by columns of Devonshire marble. The roof is ribbed with stone-work. Shrubs are planted on the outside of the building, and iron rods fixed into pillars of Hanham stone, inclose the whole. These structures were designed, and have been carried out in all their details, by Mr. W. Smith, builder; the ironwork being done by Mr. S. Hobbs. Messrs. Palmer & Sheppard, of Bristol, executed the carving.

Leicester Cemetery. — A monument has been placed in the Church of England portion of this cemetery, to the memory of a young lady of the name of Jessop. It consists of a massive block of polished Peterhead Scotch granite, supporting a carved pedestal, shaft, and capital, in the hard grit stone from the Gaseby quarries, near Shipley, Yorkshire, terminating at an elevation of about 18 ft., with a sculptured statue of "Hope," in Sicilian marble, forming in the whole an attractive *ensemble*. The design is by Mr. Joseph Goddard, architect, of Leicester, and the work has been executed by Mr. John Barratt, also of Leicester.

BRICKMAKING BY MACHINERY.

Extensive works for the manufacture of bricks have just been completed by Major Stapylton, of Myton Hall, Helperby. The estate, under the management of Mr. Calder, is undergoing great improvement, especially in the erection of model farm-buildings and improved dwellings, requiring large quantities of bricks. To insure making more solid bricks than by hand, and doing away with skilled labour, he has introduced machinery driven by steam-power, which enables him to produce bricks with smooth surfaces like the "patent bricks." This is all done in one operation. After the clay is cast in the ordinary way it is put into wagons, and by means of a rope connected with the machine it is hauled up a tramway and tipped on to the rollers, which crush all foreign matter, such as stones, and thence enters the pug-mill, where it is thoroughly incorporated and made ready to enter the dies, from which it passes to the two cutting-tables, on each of which are cut at once six bricks. The average production of this machine is 20,000 per day. They are not, as with the ordinary hand-made bricks, put upon "the flats," but walled up at once as they come from the machine six or eight bricks high, thereby saving much expense in drying. Those bricks which are wanted for very particular purposes, such as facing, are passed through a special machine,—"the rotary press,"—which performs its work of pressing, and thereby consolidating the bricks. A brick is simply placed in front of the piston, which then forces it into the mould or die (of which there are four on a revolving shaft) of the desired size, and any superfluous clay is cut off, thus making all the bricks true and of uniform dimensions. During the return of the piston the box of dies or moulds revolves one-fourth of the way round, thus presenting another empty mould, which has already been oiled and cleaned by a self-acting lubricator, directly opposite the piston, to receive the next brick. In the meantime a self-acting push-plate forces the brick already pressed out of the die, upon a self-acting table, which carries them away, each brick being impressed with the initials of the proprietor.

Both of the machines described are driven by a horizontal engine, and are the productions of Mr. John Whitehead, of Preston, Lancashire, whose name is well known in connexion with brick-making plant.

FROM WALES.

Llanfechell Church, Anglesey.—This parish church, which is dedicated to St. Mechell, has been re-opened. The additions and alterations that have been made consist of a new north transept; the adaptation of the lower story of the tower as a robing-room; the removal of plaster ceiling, old pews, and other fittings; and replacing open sittings, modern pulpit, and prayer-desk; repairing and re-decorating the screen, which has now, with the wrought-iron crosting and central cross, a pleasing outline; the re-setting the font, which is of peculiar design, and is an object of interest to antiquaries; the introduction of standards, altar-rails, and other ironwork from the establishment of Messrs. Brown & Dowring, of Birmingham; the re-slating roof, re-coping gables, and the insertion of some new double-lighted windows of the same style as the lancet in the south side of the chancel. A stained-glass window, by Clutterbuck, of London, has been set up in the east window. It is the gift of Mr. W. B. Hughes, M.P., Plas Coch, as a memorial of his ancestors buried in Llanfechell Church.

Llanllechid National Schools.—These schools have lately been enlarged for the Ven. the Archdeacon of Merioneth.

A new church at *Llanfaglan*, near Carnarvon, is now in course of erection, in addition to the present parish church, which is remotely situated. The new church is intended to accommodate a large and more populous part of the parish.

The church at *Bodedern* is now in the course of restoration and enlargement. The Ven. Archdeacon of Bangor has used energetic efforts to procure funds for this purpose.

The parish church of *Llangwyfan* being severed from the main land by the encroachment of the sea, it has been found necessary to build another edifice in a distinct part of the parish, and by the liberality of Mr. O. A. Fuller Meyrick, of Bodorgan (who has gratuitously presented a site), and the rector and his curate, this is to be done. The architects in this and the preceding cases are Messrs. Kennedy & O'Donoghue.

CHURCH-BUILDING NEWS.

Sherington.—The parish church of Sherington, near Newport Pagnell, has been re-opened for public worship, after having undergone a restoration. The church is a cross church, the tower being in the centre of the building. It has north and south aisles. The old church had the high-backed pews, abundant whitewashing, and a platform at the west end, which marred the beauty of the west window. The whitewash has been removed, the high-backed pews have been replaced by chairs, the floor of the church presenting an open area, and the disfiguring of the platform has been removed. The church has a lofty, open roof. The chancel shows the most marked feature of restoration. It has a new open roof of oak, and has also been newly tiled. The reredos is of alabaster, inlaid with black marble, and is adorned by a cross of polished granite. The chancel floor is inlaid with Godwin's tiles, the choir stalls are of oak, there is a new iron altar-rail, and the chancel is divided from the nave by a pair of new wrought-iron gates, the work of Messrs. King & Sons, of Stoke Goldington. A recess has also been built for the organ, and adjoining it is the vestry. A painted east window represents in its three lights the circumstances surrounding the birth of Christ, His baptism by John, and His crucifixion. During the work of restoration the builders came upon a small single-light window looking upon the chancel. This has been restored, and a painted glass window placed there. Formerly the bells were rung from the ground-floor, so that the ringers inconveniently intervened between the nave and the chancel. This has been remedied by the erection of a new ringing-floor, so that the communication between the nave and the chancel is uninterrupted. The church is heated with hot air, the principle applied being in use in various churches in the neighbourhood. A memorial window, looking upon the south aisle, has been erected by Mrs. Umney, in memory of her late husband. The south porch has been restored, and a north doorway, disfigured by the mutilations of former years, has been discovered and restored. The restoration has not been carried as far as absolute necessity demands. The work has cost something like 1,000*l.*, mainly defrayed by the rector. The architect was Mr. G. E. Street; and the builders were Messrs. Shakeshaft & King, Newport Pagnell.

Manchester.—The new Church of St. James-the-Less, Newton-street, Great Ancoats, has been consecrated by the Bishop of Manchester. The building is of brick, constructed in the Early English style of architecture, with stone and coloured brick dressings, and coloured brick decorations in the interior. The church will seat 654 persons, and about 400 of the sittings will be free. The cost amounts to 2,500*l.*, all of which has been paid, except the sum of 300*l.*

Minsterworth.—The rebuilt parish church has been opened for divine service. It stands on the site of the old edifice, and is built of the grey stone of the neighbourhood, with Bath stone dressings. It has been erected upon a higher level, and has a tile-covered roof. The old tumble-down lath-and-plaster tower at the west end of the north aisle has been replaced by a new structure with a stone turret, and provided with six bells. On the south side of the nave is an oaken porch with open-timber work; and, seeing that the floods and high tides have made it needful to have the floors considerably above the churchyard level, all the entrances are approached by flights of steps. Instead of the two naves formerly existing, the church has now one nave and a lean-to aisle, separated by a new arcade, and an ample chancel and chancel-aisle or chantry. An arcade of three pillars separates the chancel from the chantry. The nave has an open-timbered ceiling. The chancel and sanctuary are paved with Minton's plain and encaustic tiles, and the aisles with Peake's; and there is Porrett's heating apparatus beneath the floors. The chancel arch is plain, and the corbels of the new pillar arcades are waiting to be

carved. An oaken screen divides the chancel from the nave, and when completed will be surmounted by a cross. The sanctuary rails are of plain oak. The doors are of sound oak, with ornamental hinges; there are new stalls in the chancel; and the old open seats in the nave, with their linen-pattern ends, have been simply repaired and restored. All the windows, save three, are of plain glass, with green-tinted border, and several of them are restorations from the old church. The large east window and the two smaller ones on the south side of the chancel are of painted glass, by Messrs. Clayton & Bell, and have been placed as memorials to the Hawkins family. In the east window the old tracery, with its Plantagenet lions, is preserved; and there are two sets of scenes in the three lights, each apparently representing events in the Saviour's life,—the Transfiguration, the Lord's Supper, the visit of the Wise Men, and so forth; and several Scriptural scenes are also graphically portrayed in the side windows. Mr. H. Woodyer was the architect. The contract was for 2,640*l.*, but did not include all items.

Ormskirk.—The foundation stone of Christ Church, Douglas, near Ormskirk, has been laid by Miss Morris, of Fairhurst Hall. The cost of the church will be over 5,000*l.*, and it will be built at the expense of Miss Morris, as a memorial of her mother. The site for the church and school is the gift of Sir Thomas George Fermor Hesketh, bart., M.P., of Rufford Hall. The plan of the church consists of a nave, 57 ft. by 28 ft., and 42 ft. high; north aisles separated from the nave by four pointed arches; chancel, 29 ft. by 20 ft.; organ-chamber and vestry on the north side of chancel; and a tower and spire, the lower portion of which is intended as a children's gallery. The tower is on the south side. Accommodation is provided for 409 adults. The whole of the benches and stalls will be of pitch pine. The inside will be lined with ashlar work, and the exterior will be built of Parbold stone, in courses and quarry face, and the dressings of Longridge stone. The tower and spire form a prominent feature on the plan, and will be about 115 ft. high. The architects are Messrs. Myres, Veevers, & Myres, of Preston; Mr. J. Pownall, of Preston, is clerk of the works; and Mr. John Preston, of Wigan, the builder.

Castle Hedingham.—The ancient parish church of Castle Hedingham has been re-opened after restorations. The lord of the manor and patron of the living, Mr. Lewis Majendie, has commenced the restoration by taking in hand the chancel, which he has restored at his own expense, and in accordance with the style of the period when it was erected,—late Norman. The work has been carried out by Mr. Z. Rogers, of Earls Colne, under the directions of the architect, Mr. Henry Woodyer, of Grafham. The roof has been restored,—it is high-pitched, with open rafters; the apex had been taken off and covered with a lead flat. The lancet windows in the walls have also been restored externally and internally, and fresh stonework inserted where necessary. The walls have been underpinned and refaced; all the old plaster being scraped off, and the stone flat buttresses and other work shown. On the north side an organ-chamber has been erected, opening into the north aisle by means of a screened arch and by a Norman arch, with its characteristic mouldings, into the chancel. The walls inside have all been re-plastered and the arcading restored, together with the chancel arch. A new corbel table runs under the eaves of the roofs outside. The carved fifteenth-century rood-screen, dividing the nave from the chancel, has also been restored, and gates added; a tall floriated cross, in the same crocketed style, being placed above in the centre. The ancient stalling, with curious and ludicrous carvings under the *misereres*, have also been restored, and additional stalls and "priests' seats" erected. The floor has been paved with Minton's tiles. A new floor has been laid in the vestry, the walls re-plastered, and the windows re-glazed. The three eastern lancets are filled with stained glass, manufactured by Messrs. Hardman & Co., Birmingham.

Acton Trussell.—St. James's Church, which has been closed nearly eight months, during its restoration by Mr. G. E. Street, has been re-opened for divine service. Two arches, one in the north wall, and another between the nave and tower, have been re-opened; as also a lychnoscope at the south-west end of the chancel. The screen between the nave and the new aisle is worked out of the sound portion of the old roof. The quaint-looking steeple, and parts of the north and south walls, have been rebuilt; a new roof has taken the place of the plastered ceiling, and the substitution of benches for pews, and the addition of a small aisle on the north-east side, give accommodation for 150 in the place of ninety-four. A small memorial window on the south-west side, by Clayton & Bell, has been given. The entire cost of the restoration is between 1,100*l.* and 1,200*l.* Mr. Espley, of Eccleshall, builder, has carried out the work.

Tansley.—The church of Tansley has been restored. Instructions were given to Messrs. Stevens & Robinson, of Derby, architects, to prepare plans for an extension of the north aisle, and for re-pewing the church. A contract was subsequently entered into with Messrs. Buxton & Son, of an adjoining parish, for the execution of the work; but within two months after the stone was laid both father and son died, and were buried in Tansley churchyard. A younger son, however, agreed to carry on the contract. The addition of one wing only to the church produces somewhat of an oddity; but it is intended to add a corresponding wing should further accommodation be required. These alterations will render necessary an enlargement of the chancel, which even now is too small. The whole of the ceiling has been replaced by new rafters, and the church is almost entirely repewed with open benches. The total cost of the alterations is 511*l.* 10*s.*

DISSENTING CHURCH BUILDING NEWS.

Doncaster.—The memorial stones of a new Wesleyan chapel and schools, in Oxford-place, have been laid. The new buildings are situated to the south of St. James-street, and occupy the rising part of the ground lately known as Crowther's-gardens. The front of the chapel faces the new street called Oxford-place, the schools being placed on either side, at a distance from the chapel of 46 ft., those to the right being for boys, and those on the left for girls and infants. The three front entrances of the chapel are reached by a broad flight of eight steps, terminating with a landing 3 ft. wide. The central doorway, leading to a central lobby, communicates to the body of the chapel right and left. The side doorways lead directly to the gallery staircase, and terminate on broad landings to each gallery. At the sides and rear of the chapel there are also provided three entrances, which will afford extra means for ingress or egress, as required. On the ground-floor, at the rear of the chapel, is a band-room, 33 ft. by 16 ft.; ministers' vestry, 16 ft. by 10 ft. 6 in.; two W.C.s, and lavatories. Also, from this part of the building, a staircase communicates to an upper floor, which contains two class-rooms, 15 ft. by 9 ft.; two, 16 ft. by 11 ft.; and one, 21 ft. by 12 ft. The outside dimensions of the building are 57 ft. 6 in. by 107 ft. The design is Italian, and the front and the return staircase wings executed in stone, the sides and rear being faced with white bricks. The chapel is divided into nave and aisles, the clearstory walls and nave roof being carried on cast-iron columns and wrought-iron box girders; the columns also support the side galleries. Under the galleries at each side are six semicircular-headed windows; a similar number are placed on each side for the galleries, and on the clearstory, on each side, are seven semicircular windows, 6 ft. diameter. The centre part of the front elevation rises to a height of 53 ft., this being the height of the nave roof; the wings, being lower, have a parapet, which continues round the sides, so that only a little of the aisle roofs will be seen. The roofs will be covered with the best Bangor slates. The interior ceilings of nave, aisles, and galleries will be divided into panels, and embellished with ornamental plaster-work. An organ-gallery is formed behind the pulpit or platform, and the opening is finished with an arch ornamented and moulded. The whole of the interior fittings will be of red deal, and wrought, stained, and varnished; the iron-work flatted and picked out in tints. The chapel will seat 1,000 persons. The school buildings on the left comprise girls' school, 54 ft. by 20 ft.; infants' school, 70 ft. by 20 ft.; and class-room, 15 ft. by 20 ft.; with lavatory and cloak-rooms. Those on the right are boys' school, 81 ft. by 20 ft., and a class-room, 16 ft. square, these also having entrance-lobby, lavatory, &c. Attached are large play-grounds and out-offices. These buildings are also of Classic character, and are faced with white bricks, red brick plinths, bands, strings, arches, cornices, and stone dressings. The interior woodwork of the roofs will be exposed to view, which, with all the other interior wood, will be wrought, stained, and varnished. The boundary walls will be coped and faced with stone, and surmounted with wrought-iron railings, having also two pairs of entrance carriage-gates, inclosing the front of the chapel in a semicircular form; also, running across right and left of the chapel to each school, will be walls and railings, entrance-gates for the schools, &c., but of more simple design. The contract for the whole has been undertaken by Mr. H. Arnold for 5,262*l.*, and is being rapidly pushed forward by him, under the supervision of Mr. W. Watson, of Wakefield, the architect.

Fenton.—A Methodist New Connexion new chapel has been opened here for public worship. The new edifice occupies the site of the old chapel, with the addition of ground at the rear, from which some old buildngs have been removed. It is in the Gothic style of architecture, according to examples in France and Germany in the thirteenth and fourteenth centuries. The total length, exclusive of the entrance, is 55 ft. 6 in.; the width, 40 ft. 3 in.; the height from ground line to ridge, 51 ft. The front gable, facing Market-street, contains the principal entrance, and has three wide doorways with moulded arches, and stone labels with carved terminals, supported by circular stone shafts, with circular moulded bases, bands, and carved caps, the whole surmounted by a large five-light stone window with tracery in the head. To the right and left of the entrance are staircases leading to the galleries and orchestra, the right staircase being surmounted with a tall, slated, spirelet roof, and the left staircase surmounted by a tower with buttressed angles and spire, the total height of which is 110 ft. to the top of the metal finial with which it is to be crowned. There is a gallery around two sides and one end, with a circular enriched and moulded front. The school, which is at the further end of the chapel, is two stories high, entrances to which are from Park-street. The total length is 56 ft. 6 in., and the width 35 ft. 6 in. The rooms are divided into departments for boys and girls, with separate entrances, in which are a number of class-rooms. Portable partitions are fixed in the upper room, so as to be readily taken down in order to admit of the room being used as a lecture-hall, or for public meetings. The chapel will accommodate about 700, and the schools are sufficiently large for nearly that number of children. The total cost, including the purchase of old buildings to enlarge the site, has reached nearly 4,000*l.*, of which sum there have been about 2,000*l.* raised. The architect is Mr. Pinchbeck; and the contractors are Messrs. Wade, Brothers, all of Manchester. The interior, although sufficiently advanced to admit of the opening service, is not quite completed. The exterior is not quite finished either.

Stockport.—The foundation-stone of a new Wesleyan Chapel has been laid at the Moore. The building is to have a school attached, and the cost will be 1,000*l.* The size of the chapel will be 38 ft. by 23 ft.; the school, 29 ft. by 16 ft. The latter, being only separated by folding doors, can be opened to the chapel during divine service. The frontage will be 81 ft. in length. The rear will extend to the embankment of the London and North-Western Railway. Accommodation for seating 160 persons will be provided. The architects are Messrs. Pierpoint, Hughes, & Pierpoint, of Warrington. The style will be Gothic.

Lincoln.—The memorial corner-stones of the new chapel for the Baptist congregation worshipping in Mint-lane have been laid. The building now being erected by Messrs. Barnes & Wright, builders, from the designs of Messrs. Drury & Mortimer, architects, is situate upon the old site in Mint-lane, and has a superficial area of 2,040 ft., with 600 sittings. The old chapel was 1,600 ft. in area, with 360 sittings. The additional sittings have been gained by making every spare inch of the ground available, and to this end the front of the building is close to the foot pavement, and arranged without any breaks. The front is designed in the modern development of the Romanesque style, and is arranged in three stages—the lower, containing the two entrance doorways and the triplet window, lighting the centre body of the chapel; the second stage is occupied by a window lighting the gallery floor; and the upper stage consists of an arched opening, combined with an arcaded coping to the gable. A slight depression of the north side roof gives more distinction to the centre composition, and a tower, with angle turrets and

low slated spire—total height, about 70 ft. at the south angle—marks the purpose of the building. The interior is proposed to be fitted with open seats. The pulpit will accommodate several ministers. The baptistery, which is placed in front of the pulpit, will be lined with white glazed tiles. The entrance passages on the ground-floor will be paved with Maw & Co.'s geometrical ornamental tiles. The building will be heated by hot water, and lighted with star burners suspended from the roof. Attention has been given to insure ventilation. The building is to be covered in with an open timber roof, and a sufficiency of light is secured by the aid of a long range of clearstory windows on each side of the roof. There will be large windows towards the south, overlooking the garden premises of Messrs. Smith & Ellison's bank. These windows, together with three others on the north side, will insure abundant light, which, for the present, is to be subdued by the adoption of cathedral tinted glass, with the intention, ere long, when funds may permit, of replacing it with stained glass. The probable total cost of the edifice will be about 1,400*l.*, exclusive of the value of the old materials.]

Ripon.—The foundation-stone of a Congregational church has been laid here. Mr. J. P. Pritchett, of Darlington, is the architect. The contractors for the church are the following:—Messrs. Wright & Son, Thirsk, masons and plasterers; Messrs. M'Adam & Co., joiners and iron-founders, Alston; Mr. G. W. Wilson, plumber, Leeds; Mr. Briggs, painter, Lowmoor. Mr. W. Dougill, of Ripley, is clerk of the works. The cost of the church, including fencing and out-buildings, will be about 3,000*l.* There will be a tower and spire at the south-west corner 100 ft. high. The gable end next the main road will contain a door under a projecting gable in the floor level, with a four-light window over it rising into the main gable, which is surmounted by a floriated cross or finial. The tower at one corner is in four stages, brushing a somewhat narrower door in the lower stage, a two-light window in the second stage, and belfry-windows in the upper stage; the whole surmounted by a spire, finished by a vane. A staircase will occupy the opposite corner, having a similar door in the lower stage, and a rose-window above, the roo being hipped to the octagonal shape of the staircase. The side of the church faces the new road, which the trustees of the ground are making. The side is relieved by the transept gable end, which has two windows on the ground, and a rose window above. The rest of the side is divided into four bays, the corner one being occupied by the tower and spire, the others having long two-light windows between buttresses. The choir is somewhat lower than the nave, and has a rose-window in the gable. Behind the church is the school, with the gable end to the side road. At the east side of the church is the minister's house, which is simple, but characteristic in design. It has a bay-window of two stories in the front; and the house being irregular in plan, the hipped roofs break up the outline. Internally, the church is divided into nave and aisles by light iron pillars supporting a narrower gallery running round three sides of the church; and these pillars rise above the gallery, to support wooden arches, from which rises the roof, which is wagon-headed, divided into panels by carved braces and moulded purlines. The choir arch is of moulded stone, with marble pillars, carved capitals, and moulded bases. The seats, which provide accommodation for about 600 adults, are to be all open stalls, with slanting backs, all of pine, varnished. The windows will be glazed with cathedral-tinted glass, and the passages paved with mosaic tiles. The school is designed to have a simple open roof, and will accommodate about 300 children. The whole of the site is to be surrounded by an ornamental railing on a low wall.

Books Received.

Report to the Tottenham Local Board of Health on the Disposal of the Sewage of their District. May, 1870. London: Spon.

This Committee report enters at some length into the details of various systems of treating sewage, by deodorisation, irrigation, &c., as practised in different parts of the country; and the reporters come to the conclusion that irrigation, upon the whole, is decidedly the best. The report is signed Edward Clarke and James Brickwell, two of the members of the Sewage Committee, and P. P. Marshall, C.E., surveyor to the Board. A dissentient report is appended, signed William Hall, Member of the Committee, who advocates precipitation and filtration with deodorisation "by the best means known." The dissentient member, however, according to the committee's report, agrees with them so far "that irrigation is on the whole the best method of dealing with the sewage," although he "would recommend precipitation and filtration for Tottenham." The committee recommend that some of the marsh-land in the parish should be selected as a sewage farm for the greater part of the sewage, in the disposal of which, in any way, pumping will be requisite; and, for the remainder, they find that land is obtainable at a reasonable price in a favourable position for irrigation.

Patronymica Cornu-Britannica; or, the Etymology of Cornish Surnames. By Richard Stephen Charnock, Ph. Dr., &c. London: Longmans & Co.

Now that the Cornish dialect of the Keltic language is literally extinct as a spoken tongue, a list of Cornish proper names, with their etymology and meaning, is both curious and valuable. The present collection is made from various quarters, including the Post-office Directory for Cornwall; from private lists, and from the works of Pryce and Polwhele. The volume contains from 1,200 to 1,400 surnames. Many of the Cornish surnames, however, are more or less identical with the Welsh, but there are many Cornish and few Welsh in existence.

VARIORUM.

"*Les Promenades de Paris: Bois de Boulogne, &c.* Par A. Alphand and G. Davioud." We have already spoken of the earlier parts of this superb work. Since then, many more have been issued, and we shall take an opportunity to speak of them fully. The publisher is at this moment in London (11, Portland-terrace, St. John's Wood), and we go out of our way, in view of the present exceptional and distressing position of Paris, to mention this circumstance, in case any of our readers should feel inclined to examine the work for themselves.——The current number of the *Art Journal* includes an engraving after W. Hemsley's "Left in Charge." Wilton House is the subject treated of by the editor under his heading, "The Stately Homes of England."——A photograph of a Portrait by Vandyck, name unknown, in the new number of *Art Pictorial and Industrial*, is itself worth the cost of the number.——*London Society*, from its new quarters (Burlington-street) keeps its old aspect.——From *Cassell's Household Guide* we quote a few lines anent "The House:"—"The rapidly-increasing value of land in every district easy of approach by rail has brought about a degree of discomfort in domestic architecture undreamt of in former times. Good housewives, accustomed to roomy stair-landings, long passages, large cupboards, and separate offices for various kinds of household labour, reconcile themselves with difficulty to the circumscribed dimensions usually afforded for domestic purposes in modern villa residences. Nor is the complaint confined to the immediate neighbourhood of large towns. Even remote rural districts are becoming a prey to the novel system of house-building and its attendant inconveniences. One of the first acts of denial imposed upon most housewives, in order to meet existing circumstances, consists in giving up the keeping of any kind of stores. The nearest grocer's shop has become in most establishments the substitute for the storeroom; and a poor substitute, at the best of times, that warehouse proves, entailing endless vexations and disappointments, which were unknown when it was the custom for all well-to-do families to provide for their daily wants in advance. Fitted with every requisite to meet the numberless emergencies that arise in domestic life, the compact little apartment was at once the general resort in moments of need, and a pleasing and healthful source of occupation to the female members of a household. Intent upon laying in stores, at convenient seasons, in preserving, pickling, herb-drying, sauce-making, sorting and arranging goods, much time was profitably employed, which now hangs heavily on the hands of many women. If with the cessation of the above duties a corresponding amount of gain were secured, regrets on the subject need be but few. It is not so, however."——The *Quarterly Journal of Science* for October has much good matter on the Surveys of India, the Eclipse of August 7th, and other subjects.——Hardwicke's *Science Gossip* continues its pleasant way amongst flowers and rocks, spotted with birds and insects. The number for October is quite equal to those that have preceded it.——*The Arena* is the title of a new illustrated monthly magazine (75, Great Queen-street), which seems to desire to open a way for new and hitherto untried men. Some promising stories are commenced in it.——Messrs. Longman have issued "A Graduated Course of Elementary Problems in practical Plane Geometry. By John Lowres, Science Teacher." It is designed chiefly for the use of students in science classes in connexion with the Science and Art Department.

Miscellanea.

The Fall of the House in Glasgow: Cause of the Occurrence.—Mr. James Lamb, Inspector of Buildings, and Mr. Robert Taylor, builder, the skilled person to whom the Sheriff made a remit to inspect Messrs. Law's buildings at Belmont-crescent, which fell, have made a report describing what, in their opinion, caused the accident. In substance the conclusions to which they have arrived are as follow:—That the occurrence resulted partly from too hurried construction, not permitting time for the consolidation of the lime and stone in the building, partly from the joisting lying wholly in one direction, instead of alternate cross tiers, which would have given a certain support to the walls that fell; but chiefly from the stones being of inferior quality, badly dressed, and carelessly put together, without a sufficient proportion of headers or band stones. The reporters further consider that the mortar was wanting in a sufficient proportion of lime, and was consequently deficient in cohesive power; that the packing of the walls between the exterior and interior facing stones was of bad quality, being mere shivers; and that, generally, the mortar, such as it was, was too sparingly used. It appears that nothing was discovered in the foundation to account for the fall of the building.

Mortuary Buildings for City of London.—At the last meeting of the Commissioners of Sewers, a report of the Sanitary Committee with reference to the erection of mortuary buildings for the City, was considered. The chairman stated that some time ago the Court authorised the committee to spend 13,000*l.* in the purchase of a site, and the erection thereon of a mortuary. A site had been purchased for 5,000*l.*, and 8,000*l.* remained for the buildings. Since then another piece of land adjoining the site had been offered to them for 750*l.*, and the question was whether they should purchase it. Mr. Haywood's estimate for the buildings was 9,400*l.*, so that, including the additional piece of ground, the total cost would be 15,000*l.*, being an increase of 2,000*l.* upon the amount authorised to be spent,—namely, 13,000*l.* Some discussion took place upon the subject, in the course of which it was stated that one of the metropolitan parishes had provided a mortuary for 1,000*l.*, and an opinion was expressed that 15,000*l.*, or even 13,000*l.*, was too large a sum to be spent on a mortuary for the City, in which there would be only a few bodies. Eventually a vote was taken adverse to purchasing the additional piece of land, and the whole subject was referred back to the committee for further consideration.

The New Town Clock, Hoddesdon.—This clock was manufactured by Messrs. Gillett & Bland, of Croydon (who were also the makers of the great clock for the International Exhibition of 1862, exhibited by Benson, and of the Gog and Magog clock at Bennett's, in Cheapside). It goes eight days, and strikes the hours upon the old bell, and the quarters upon the two new bells, and shows the time upon three dials, each 4 ft. in diameter, one of which, facing the High-street, is illuminated upon an improved principle by gas; the other two dials are copper, with gilt figures and minutes. Amongst the many improvements introduced in the clock is the gravity escapement, the invention of Mr. E. B. Denison, Q.C.; and instead of the ordinary wood rod pendulum, which is subject to considerable variations, it has a compensated zinc and iron pendulum. There is an engraved and silvered dial on the clock, for the purpose of regulating the outer hands from the inside.

War Appliances.—Advices from Paris, by balloon mail, announce that an immense iron reservoir, supported upon bricks, has been placed in front of the Gallery of Apollo in the Louvre, and will be kept filled from the Seine by two steam pumps, as a precautionary measure in case of the Louvre or Tuileries taking fire. The Paris Government have taken possession of all the carriages of the Chemin de Fer du Nord for special ambulance service upon the ramparts. ——The present war is likely to give a great impulse to man's rule over the air. Experiments are being made with balloons by the Government authorities at Woolwich. They find that captive balloons can be fitted with telegraph wires, and messages sent to head-quarters instantaneously, pointing out the progress of an action as regards the state and procedure of both armies. Panoramic photographs of a whole field of war, whether previous to, during, or after the battle, can be taken and studied at leisure. War balloons in store will, no doubt, be a new item in war supplies.——A French paper says that the difference of gauge between the French and German railways has proved a hinderance to the Germans in using their own engines and carriages on the former. The bridges and viaducts in France are so low that it has been necessary to shorten the chimneys of the German locomotives very considerably, and this takes up a good deal of time.

Foundation-stone of Old Blackfriars Bridge. — The foundation-stone of old Blackfriars Bridge was last week discovered. Beneath the stone was found a guinea, a half-guinea, a crown, a half-crown, a shilling, two sixpences, 31 halfpence, and a farthing, and upon it was the following inscription:—

"On the last day of October, in the year 1760,
and in the beginning of the most auspicious reign
of George the 3d,
Sir Thomas Chitty, Knight, Lord Mayor,
Layd the first stone of this Bridge,
undertaken by the Common Council of London
in the height of an extensive War,
for the Public accommodation
and ornament of the City,
Robert Mylne being the Architect,
and that there may remain to posterity
a monument of the City's affection for the man
who, by the strength of his genius,
the steadiness of his mind,
and a kind of happy contagion of his probity and spirit,
under the Divine favour
and fortunate auspices of George the Second,
recovered, augmented, and secured
the British Empire
in Asia, Africa, and America,
and restored the antient reputation
and influence of his Country
amongst the Nations of Europe,
the Citizens of London have unanimously voted
this Bridge to be inscribed with the name of
William Pitt."

"Colours and Dyes in Early Times."—Commenting on the article on this subject, reprinted from our pages, the editor of the *Mayo Constitution* says,—"Through the length and breadth of our island the traveller will not light on any portion of it more pregnant of associations of old times than West Connaught. This is particularly the case with regard to the subject matter of the above paper. The Claddagh cloak of every description is very remarkable. The other day, a Galway tradesman had the distinguished honour of receiving an order for one each (crimson pattern) for her Royal Highness the Princess of Wales, Princess Beatrice, and Princess Christian. That there was no indigenous plant in this country to dye blue in Dr. Nicholson's day (1725) can only be true so far as the extent of his inquiry went, for the blue dye has been known to the peasantry of Mayo for generations.* The colour predominates in Partry. If a peasant is seen wearing a pair of blue stockings, he is at once put down as a Partryman. In the parish of Turlough, near Castlebar, there is an excellent blue frieze made, containing a very small admixture of white. The purple dye is peculiar to the clothing of the people of the baronies of Tyrawly and Costello. Before the famine, a comfortable-looking dark brown dress was worn by the country girls. Now-a-days they wear muslins and light frippery, to be *à la mode* if they can.

The Hulme Town-hall.—The interior of this building has just been decorated by Messrs. Edmondson & Pollitt, of Bridge-street, Manchester, at a cost of nearly 600*l*. The walls of the hall have been painted a dark colour, and the ornamental parts gilded and figured. The ceiling has been painted in several striking colours. The large refreshment-room and the committee-room have also been decorated.

* Exactly what we stated.

Proposed New Naval College.—Admiral Kelly, who died about three years ago, left by his will a sum of money, supposed now to amount to upwards of 100,000*l*., to found a college in Devonshire for the primary education of naval officers' sons. The will has been the subject of litigation, but arrangements have just been come to by which all further opposition ceased, and it is stated to be almost certain that the college trustees will accept the offer of the Duke of Bedford to give a fine site for a college at Tavistock, and 5,000*l*. towards the cost of its erection. It is also said that the Tavistock Grammar School will be merged into the new college. The matter has excited great interest and competition among various towns in South-West Devon.

Re-opening of Gingerbread Hall Bridge. This new bridge at Great Baddow, which has been erected by the Chelmsford Highway Board, has been opened for traffic. It is 17 ft. wide between the iron railings, or 6 ft. wider than the old tumble-down structure which it has superseded. It is built of brick and iron, the work having been carried out under the superintendence of Mr. Whitmore, the surveyor to the Board, by the following contractors:—For brickwork, Mr. James Patten, Great Baddow; ironwork, Messrs. Coleman & Morton, Chelmsford; stonework, Mr. Wray, Springfield.

Keeping Bronze Statues Clean.—It was observed in Berlin that those parts of a bronze statue which were much handled by the public retained a good surface, and this led to the conclusion that fat had something to do with it. An experiment was therefore tried for some years with four bronzes: one, says our authority, *Chambers's Journal*, was coated every day with oil, and wiped with a cloth; another was washed every day with water; the third was similarly washed, but was oiled twice a year; and the fourth was left untouched. The first looked beautiful; the third, which had been oiled twice a year, was passable; the second looked dead; and the fourth was dull and black. Perhaps public authorities in this country who have charge of statues and other adornments will profit by the experiment here described.

Laying the Top Stone of Chester Cathedral Tower.—The top stone of Chester Cathedral Tower has been laid, as marking an important stage in the completion of the restorations. The stone was laid by a little girl, the daughter of Dean Howson, in presence of some American and other friends. Before the party descended from the tower, which was not done until Dr. Howson's young daughter had been lifted to a seat on the top of the pinnacle, the Dean expressed a hope that arrangements would soon be made, in co-operation with Mr. Thompson, the contractor, for some celebration of the event by all the workmen under his superintendence. This will probably take place when the external roof of the nave has been completed.

New Masonic Hall in Bristol.—It is said that the erection of the new Masonic Hall, to be built in Park-row, on a portion of the Tyndall estate, exactly opposite Park-street avenue, will be very shortly commenced. The entire plan, according to the local *Times*, embraces a banqueting-hall, with its necessary appendages, including kitchens, and will cost 5,000*l*.; but the promoters will at first only proceed with the portion necessary for the meetings of the several lodges, the cost of which will be between 3,000*l*. and 4,000*l*. The structure is to be worthy of the city.

"Stanmore, Salop."—We would add to the account of this residence, given in the *Builder* of last week, that all the painting and coloured decorations were executed by Messrs. J. G. Crace & Son, of London. It is desirable, also, we should point out that a doorway to the dining-room from the hall is accidentally omitted to be shown on plan.

Straightening a Chimney.—It is stated that the furnace-chimney at the Goole Alum Company's works having subsided to the extent of 4 ft. out of perpendicular, was thus set right:—A layer of bricks, about two-thirds of the way round, and about 20 ft. from the base, was cut out. When this layer of bricks had been taken out, strong iron wedges were introduced, and a thin layer of brick put in the place of the course of bricks extracted. When this had been accomplished, the wedges were then drawn out, and the stupendous structure came over on to the new-made bed, assuming its original position. This was a dangerous process, and needed clear heads.

TENDERS.

For finishing two pairs of villas in Hornsey-lane. Mr. J. W. Reed, architect:—

Williams & Son	£3,487	0	0
Sale	2,842	0	0
Winship	2,705	0	0
Hawkes	2,665	0	0

For alterations and additions to stables at Tewkesbury Lodge, Forest-hill. Messrs. Tress & Innes, architects. Quantities supplied:—

Colls & Son	£695	0	0
Coleman	690	0	0
Thompson	680	0	0
Fish	660	0	0
King & Son	656	0	0
Burchell	651	0	0
Waterson	645	0	0
Heards	634	0	0
Jerrard	619	0	0
Mitchell	550	0	0

For the erection of a new tun-room for Messrs. Taylor, Walker, & Co., Limehouse. Mr. Charles Dunch, architect. Quantities supplied:—

Macey	£1,329	0	0
Conder	1,295	0	0
Johnstone	1,279	0	0
Palmer	1,250	0	0
Ennor	1,244	0	0
Newman & Mann	1,136	0	0
Kilby	1,130	0	0
Hill, Keddell, & Waldram*	1,058	0	0

* Accepted.

For the erection of schools, Bermondsey. Mr. Joseph Gale, architect:—

Colls	£4,678	0	0
Ashby & Sons	4,450	0	0
Sewell & Son	4,363	0	0
King & Son	4,365	0	0
Henshaw	4,363	0	0
Sheppard	4,275	0	0
Browne & Robinson	4,251	0	0

For new sewers, Catford Bridge, Anerley and Forest-hill, for the Lewisham Board of Works:—

Coker	£864	17	0!
Crockett	862	0	0
Pearson	742	0	0
Bellamy	703	0	0
Cole	691	17	0
Hayward	677	0	0
Woolnough	653	0	0
Blackwood	587	0	0
Pizzey	569	0	0
Harris	525	0	0
Young	522	0	0
Carter (accepted)	520	0	0
Hubbard	486	0	0
Haynes	347	2	0!

For new infirmary for St. Mary Abbot's, Kensington. Mr. A. Williams and Mr. H. Saxon Snell, architects. Quantities by Messrs. Lansdown & Pollard and Messrs. Mann & Saunders. Net amounts after deducting the value of the old buildings on site:—

J. & A. Wright	£40,060	0	0
Hockley	39,783	0	0
Cowland	38,980	0	0
Scrivener & White	37,943	0	0
Lacey	37,690	0	0
Crockett	37,495	0	0
J. & S. Williams	37,000	0	0
Capps & Ritso	36,600	0	0
Crabb & Vaughan	36,525	0	0
Higgs	36,273	0	0
Blackmore & Morley	36,191	0	0
Manley & Rogers	35,666	0	0
Markwick & Thurgood	35,153	0	0
Wigmore	34,585	0	0
J. & A. Wilson	34,550	0	0
Henshaw	33,457	0	0
Hill, Keddell, & Waldram	33,276	0	0
Chappell (accepted)	33,233	0	0

For new sewers for the parish of Lambeth. Mr. Hugh McIntosh, surveyor:—

Crockett	£13,500	0	0
Dickinson & Oliver	12,290	0	0
Brown	11,966	0	0
Jackson	11,900	0	0
Morriss	10,600	0	0
Blackmore	10,073	0	0
Pearson	9,710	0	0
Hubbard	9,700	0	0
Goodair	9,350	0	0
Wigmore	8,999	10	0
Ritzon	8,900	0	0
Mayo (accepted)	8,499	0	0
Carter	7,895	0	0

For the erection of granary and flour-mills, Waterloo Wharf, Lambeth, for Mr. Seth Taylor. Mr. George J. Lee, architect:—

Brass	£11,720	0	0
Lawrence	11,332	0	0
Holland & Hannen	9,766	0	0
Woodward	9,685	0	0
Perry	9,654	0	0
Hill, Keddell, & Waldram	9,386	0	0
Conder	9,200	0	0
Hart	8,840	0	0
Crabb & Vaughan (accepted)	8,690	0	0

For proposed new factory and dwelling-house in Faringdon-road, for Mr. F. G. Lloyd. Mr. E. A. Gruning, architect. Quantities supplied by Messrs. Gardner & Bell:—

Kipps	£8,959	0	0
Dickinson & Oliver	8,500	0	0
Holland & Hannen	8,265	0	0
Trollope	8,243	0	0
Mansfield, Price, & Co.	8,178	0	0
Henshaw	7,967	0	0
Newman & Mann	7,856	0	0
Hill, Keddell, & Waldram*	7,595	0	0

* Accepted.

For repairs to Nelson Inn, Nelson-street, Woolwich, for Messrs. H. & V. Nicholl. Mr. E. H. Badger, architect. Quantities not supplied:—

Payne & Balding	£650 0 0
Penny	556 0 0
Jerrard	549 0 0
Bush	547 0 0

For house and stabling at Lordship-lane, Dulwich, for Mr. W. Hewett. Mr. T. R. Smith, architect. Quantities not supplied:—

	House.	Stable.
Roberts	£1,339 0 0	£195 0 0
Burchell	1,315 0 0	159 0 0
Ashwell	1,258 0 0	189 0 0
Jerrard	1,278 0 0	165 0 0

For new carriage-shed at Bow, for the North London Railway Company:—

Brutey	£13,550 0 0
Marion	12,727 0 0
Saul	10,800 0 0
Perry & Co.	10,700 0 0
Crockett	10,200 0 0
Mann	10,093 0 0
Wall	9,999 0 0
Henshaw	9,983 0 0
Blackmore & Morley	9,805 0 0
Mansfield, Price, & Co.	9,800 0 0
Blease	9,779 0 0
Snowball	9,470 0 0
Abrahams	9,414 0 0
Hill, Keddell, & Waldram	9,410 0 0
Cardus	9,090 0 0
Wicks, Bangs, & Co.	8,950 0 0
Myers & Sons	8,730 0 0
Watts	8,253 0 0

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[ADVERTISEMENT.]

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(Signed) J. M. Drago,
Treasurer of the National Government.
Jose Tomas Rojo.
Juan M. Alvarez.

A true Copy.—A. M. Bell."

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PART I.

	Maximum of Marks.
Mathematics, including Geometry, Trigonometry, Algebra, Differential and Integral Calculus, and Geometrical Optics	100
Mechanical Philosophy, including Statics and Dynamics, Hydrostatics and Hydraulics, Pneumatics, and Heat regarded as a Source of Power	100
Experimental Science, including Inorganic Chemistry, Heat, Electricity, and Magnetism	100
Geology and Mineralogy	40

No Candidate will be eligible who does not show some proficiency under one at least of the heads included in Part I.

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Strength and other Properties of Materials, and the Calculation of Strains	100
(A). Railway and Canal Engineering	140
(B). Marine Engineering, including Harbour, Dock, Sea, and Reclamation Works	140
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	1,000

*** Each of the groups lettered A, B, C, D, to include designs, estimates, specifications, and the mechanical contrivances connected with it; and candidates will be required to show that they have been engaged in the practice of their profession on adequate works for a sufficient time, or have had in some other way satisfactory opportunities of becoming acquainted with the practice of their profession in some one of the branches thus indicated. Persons wishing to compete should forward, not later than OCTOBER 31st, evidence of their age (which must be between 26 and 40) and professional training, to "The Secretary, Civil Service Commission, Cannon-row, London, S.W." Such further inquiries as may be necessary will be made by the Civil service Commissioners with regard to the age of candidates, and also as to their health and character.
Dublin Castle, 4th October, 1870.

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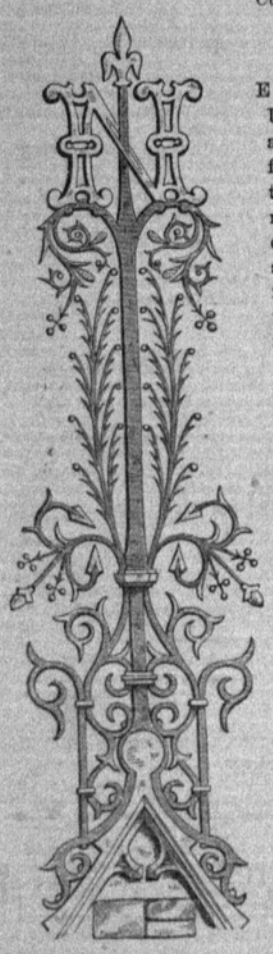
The Builder.

VOL. XXVIII.—No. 1445.

"*Canny Newcastle:*"
Social Science.



NEWCASTLE-UPON-TYNE is about nine miles from the sea, and the river Tyne is navigable to Blaydon, four miles above Newcastle, for vessels of 20 tons burthen. Large steamers and sailing vessels, drawing 15 ft. of water, can now discharge at Newcastle Quay, owing to the recent deepening and improvement of the river by the Tyne Commissioners. From the Registrar's Customs Return it may be stated that the tonnage of the port of Tyne is nearly as large as any in England, the tonnage being as follows, viz., London, 4,136,000; Liverpool, 4,676,000; and Newcastle, 4,141,000.

The population, as estimated by the Registrar-General, is 133,000. The Parliamentary boundary includes an area of 5,325 acres, the circumference being sixteen miles. This comprises an open space of ground belonging to the Corporation, to which the public has access, called the Town Moor, and which measures about 1,200 acres. With this it is to be hoped something effective will be done.

The town has greatly increased of late, as is indicated by the census, the return for 1851 showing a population of 87,000 only. Owing to the very rapid growth of the town, it was found necessary, in the year 1853, to extend the boundaries of the borough so as to include a number of outlying townships, which up to that period were beyond the jurisdiction of the Corporation as far as regards sanitary measures, many of the streets being undrained and unpaved, as is the case with other towns beyond the original boundaries. Since that date some progress has been made in providing what was necessary in this respect, but very much still requires to be done to render the borough as salubrious as it might be, such as the reconstruction and proper arrangement of sewers, the repaving of old thoroughfares, and the utilisation of the town sewage, so as to prevent its discharge into the river. We are informed that within the past three years about 150 new streets have been drained and paved, and that thirty old streets have had their drainage reconstructed. The newer-built portion of the town is partly furnished with water-closets; but in other parts there are only filthy open pits, or no provisions at all.

Leaving this part of the subject for a time, we may mention with reference to street improvements that Grainger-street, one of the most central streets in the town, is in course of extension southward to the railway station. This street is 60 ft. wide, and its additional length will be 260 yards. A new street is now being laid out from Pilgrim-street to Carliol-square, a length of about 170 yards. In the formation of these streets a great deal of closely-built property has been removed, which should admit of arrangements tending to the health of the localities surrounding them. The great fire in 1854, which consumed a large amount of old property on the quay side, has cleared the way for the erection of ranges of offices, and places of business, and open streets in place of the narrow "chares" formerly existing there. Closely adjoining the above is the Sandhill, which has also been improved by the removal of ancient timber buildings, the widening of the street, and the erection of substantial houses. At the Quayside a mass of old and ruinous property, near Sandgate, has been pulled down, and the Corporation has recently obtained powers for other street improvements in various parts of the town, the effect of which, if properly effected, will be to remove much old and closely-packed property, in addition to facilitating street traffic. The formation of two parks on the town moor, to be laid out ornamentally for the public recreation, is also talked of, and should be pressed on as a measure of great importance.

Our readers have been kept informed from time to time of architectural and artistic works in the town, and recapitulation is unnecessary. The neighbourhood of the railway station, one of the noblest, by the way, in external appearance in the kingdom, is becoming the finest quarter of the town, the monument to George Stephenson and the Roman Catholic Cathedral helping the *ensemble*. The latter has lately received an addition and an improvement in the shape of a little tower, with spire, for a staircase, connecting with the church the residences of the clergy. The effect of it is particularly agreeable. Close to the station a large and costly building is in course of erection for the Institute of Mining and Mechanical Engineers, from the designs of Mr. Dunn, of Newcastle. It will include a fine hall, lined with stone, and with an open roof. The style of the exterior is Italian Gothic. A want of agreement between the side and end of the building struck us, but it would be unfair to offer upon it any conclusive opinion in its present incomplete state. It is obviously a work to which considerable attention is being paid: stone is the material used externally, and a little variety of colour, not too violent, as is sometimes disagreeably the case, is being introduced. A handsome building is in course of erection at the corner of Mosley-street for the National and Provincial Bank of England. Our readers have heard of the restoration, under Mr. G. G. Scott, of the well-known Church of St. Nicholas, prototype of Wren's Church of St. Dunstan-in-the-East, and which was for some time in a ruinous and threatening state. It is now apparently sound and substantial, though the use of iron ties in stonework always seems to include a certain amount of risk *in futuro*. Local admirers of the church complain of an altered effect, caused by a change in the character of the new ashlar facing introduced; but without completer knowledge of the circumstances than is possessed by those merely looking on outside, comment would probably be unjust. In restorations of old buildings, difficulties scarcely known to any but the architect have often to be weighed and overcome.

The stonework of the ancient Norman castle which gave the place its name, is greatly decayed at the joints, in some parts to the extent of several inches. This produces a picturesque effect, and, the walls being very thick, does not at present interfere with the stability of the structure. It necessarily, however, admits a great quantity of water, and decay goes on with increasing rapidity. Judicious pointing with black mortar, so as not to destroy the appearance of antiquity, would add a hundred years to the possible duration of this interesting pile.

Near the county-court, where the Health Department of the Social Science Association held its sittings, two old houses, occupying a prominent position at the junction of roads, have been faced with terra-cotta, somewhat elaborately, including gables, strings, and window-dressings; and, the old flank walls remaining, the front suggests what used to be vulgarly called a "dickey," or sham front. The material, manufactured by Harriman & Co., of Blaydon-on-Tyne, seems good, and has capabilities; but the architectural and chromatic combinations are not particularly successful. The main cornice, while all the rest is light, is of a dark chocolate colour, which seems to cut off all above it from the part below.

Let us now, however, look in, with the mind's eye, where the Department is sitting, and record something of what was written and said there touching the progress, condition, and requirements of the town.

After the reading of Mr. J. Blackburne's paper on the Utilisation of Sewage, which we have already printed,* observations being invited as to the drainage of Newcastle,

Mr. Godwin, as a stranger, said the aspect of the river Tyne was something terrible, and showed a want of attention on the part of the corporation on this very question of sewage. It seemed to him that the system of drainage pursued in Newcastle was much the same as had been followed for many years, and was quite unworthy of the town, either in respect of its wealth or intelligence. He had reason to believe that the surveyor of this town was very likely to place some scheme before the ratepayers, and he respectfully hoped that the people would in the fullest and most candid manner, irrespective quite of the money question—the health question being of much greater importance—examine carefully any proper scheme that might be laid before them. They must not look to obtain a large sum for the use of the sewage at first. They should rather be content to get rid of it at the smallest possible cost.

Mr. Alderman Bell, who had presided over the deliberations of the section during the greater portion of the discussion, at the close of the debate, reverting to these remarks on Newcastle, said he did not quite understand the speaker when he said they were going on just as usual. If he meant the town had formerly been going on well, he was glad to hear a stranger say it was continuing in the same desirable course; but if Mr. Godwin meant that the governing body was neglecting its duty, he must take exception to his remarks. Without having the figures at hand he would not quote statistics in refutation of the suggestion, but he would see that information was submitted to the congress to show that Newcastle had not been idle in sanitary matters during the last twelve years. Newcastle was an extremely difficult town to deal with. Although it would be easy to collect the sewage at one point, it could not be dispensed beyond the town to the land except by first raising it some 300 feet.

At a subsequent meeting Mr. Sheriff Gregson objected to what had been said, and maintained that Newcastle could favourably compare with any town in the kingdom. The sewerage was not defective; 90,000*l.* a year was expended on a perfect system of scavenging of nightsoil which never went into the sewers; and steps were being taken to intercept all the sewers on

* See p. 783, *ante*. For other notices of proceedings of Social Science Association in Newcastle, see pp. 777, 778, 801, 802.

one side of the town, instead of allowing the refuse to be discharged into the river. Under these circumstances, it was too bad to raise such objections. Mr. Godwin, in reply, said he had no desire to prove the Town Council was in the wrong; but only to impress upon the inhabitants that some further steps were absolutely necessary in regard to the sewage of the town. He found that large outlets in existence a dozen years ago were nearly in the same condition now as they were then, and others had been added of the same character, all below low-water mark. There were some fifty on the Newcastle side of the river in a terrible state; and it was of the utmost consequence that attention should be given to the matter, instead of rebutting statements of this kind by the assertion that the town was as well sewered as any town in the kingdom; because it was not so. He denied the necessity of raising the sewage 300 ft. before it could be transferred to the land; that evidently was a mistake. On another occasion the speaker went further into the subject, and referring to a report made chiefly by Dr. Rutherford in 1866, asserted that if it had been attended to more promptly and more completely, there would have been many more living in Newcastle than there were at present, and a much better state of things existing. He was forced to repeat that there was a great deal yet to do in Newcastle. He had already taken the liberty of alluding to one or two places in this town where he had found the want of closet accommodation to be quite dreadful, and until they got provision of this sort nothing could be done, the want of it was a great difficulty in the road of progress, both moral and physical. Modesty was destroyed, habits of carelessness were encouraged, and the stories he heard on Friday afternoon from poor inhabitants of courts, if they were repeated, would carry conviction to the minds of the authorities of the necessity of a proper system of sewerage for the town of Newcastle. The town surveyor, he believed a very able man, had not yet begun to touch it, but had paved many of the streets, and had no doubt done a great deal of good in that way above ground, but had not gone down to the sewers. These latter must be attended to at once, if Newcastle was to be placed in a satisfactory condition. The condition of the children was also very bad. In the examination he had made, he spoke to not less than twenty children, of eight, ten, or twelve years of age, who knew nothing whatever of reading or writing, or had had the slightest instruction They appeared to be simply brought up to damage the community, for their own speedy death, or to fall into what was called the dangerous classes. Overcrowding had also had a most injurious effect upon the health of the people. Much undoubtedly had been done in Newcastle, but there were many parts of it which were still greatly overcrowded. In conclusion, he strongly urged the Town Council to appoint a medical officer of health for Newcastle; he was perfectly astounded to find that the town, with its many admirable buildings, had not such an officer.*

Mr. Michael remarked that it required no amount of observation from a stranger to notice on his entrance into the town its imperfect sanitary state, and in calling attention to the fact he and others would be pardoned, because they only desired to make the best return to the people of the neighbourhood for their hospitality. Now, opposite the principal hotel, where he was staying, the streets before the main door were a disgrace to civilisation. Three or four inches thick of dust had been accumulated for some days, and during the driest portion of the year in some of the streets there were pestiferous stenches. He quite agreed with what had been said as to the appointment of a properly qualified medical officer of health for the town, whose duty it should be to point out necessary improvements, and see that they were carried out.

Dr. Holland observed that with the existing sewage arrangements of Newcastle there were two very serious faults, which it might be desirable to point out. It ought to be remembered that the great object of sewers was the taking away of the filth from the town as rapidly as possible,—a defect in the Newcastle system,—and they knew that the sewers were also untrapped. So long as a large proportion of the population were allowed to live in single rooms, it was impossible for that population to be healthy. We were always giving off that which might at any time become the seeds of disease. Organic matter must be cast off; and unless, therefore, people could change their rooms—and the more they changed them the better for safety—they could not keep those rooms sweet. Unless a family could afford a house of certainly not less than two rooms, in order that one might be occupied at a time, then that family, living all together perhaps in one small apartment, could not possibly be in the enjoyment of really good health. He was, from careful consideration of the question, persuaded that in the end a working man would find it more economical to provide more rooms than one for his family.

Mr. Counciilor T. P. Barkas, replying, observed that reference had been made to the ignorance of the children, but he thought if the children of Newcastle were examined with those of other towns, they would find that they were not more ignorant than the children of Manchester and other places. They were not, he strongly maintained, in this matter worse than their neighbours. Every endeavour had and was being made by the Town Council upon sanitary matters.

Mr. Rawlinson, the president, said they had not desired to unduly censure the Newcastle authorities in bringing before the meeting the special evils alluded to, but rather in order that by their being pointed out they might be speedily remedied. The last speaker had said that certain things in Newcastle were not worse than similar ones in other towns, but he did not think that that was the right style of reply to be given. It was satisfactory to learn that the town was now feeling the benefit of the work of progress which had been carried on during the last few years. When they saw that in this population of Newcastle 15,800 families, and he supposed that each family on an average would be composed of five individuals, when that vast mass of the population was crowded into tenements of one or two rooms they could readily imagine the result. From eleven to twelve o'clock at midnight was the proper time for investigation, and between those hours he would recommend members of the town council to visit the overcrowded parts in company with a police officer, and if they did not learn a lesson that would last them for their lifetime, he was afraid they were bad to teach.

A valuable paper was read by the Rev. Dr. Rutherford, on the

Public Health in Newcastle in 1866 *and* 1869,

the object of which was to show what excellent results had followed such sanitary improvements as had really been made. In the course of it he said,—"The vitiation of the atmosphere of dwellings, by over-crowding, is one of the most powerful causes of a permanently high death-rate; and a considerable increase of over-crowding seems to have been the great predisposing cause of the excessive mortality in Newcastle during 1866. Between 1851 and 1861 there was an increase of 21,812 in the population of Newcastle, and of 3,658 in the number of inhabited houses, being a house for every six persons added to the population. During that period the people of England increased 2,138,615, and the number of inhabited houses 461,466, or a house for every 4·6 of those added. Since 1861 the augmented accommodation for the estimated increase of population in Newcastle had, up to 1866, scarcely averaged a new house for every ten persons. In 1861 there were in the borough 13,979 inhabited houses, 588 uninhabited, and 330 building. The population was 109,108 persons, or rather less than eight persons to each inhabited house, being a larger number than in any of the large towns in England. From 1861 to 1866 only one house had been provided for every ten persons of increase in population. The number of houses built, or being built, in 1862, was 387; in 1863, 220; in 1864, 187; in 1865, only 108. This marked diminution in house accommodation for the rapidly-increasing population was followed by a great increase in the over-crowding of tenements, and by a death-rate only exceeded during cholera epidemics. The evil was increased by the removal of property occupied by the labouring population, for purposes of public improvement. Towards the close of 1866 a considerable impetus was given to house-building. Between August, 1866, and August, 1867, 232 houses were built; in 1867–68, 505; in 1868–69, 443; and from August, 1869, to August, 1870, 552. During the last three years, it must be stated, 1,500 houses had been built, a number considerably greater than had been built during the preceding seven years. This great increase in building operations has tended greatly to relieve the overcrowding which invariably expresses itself in a higher general and zymotic death-rate. The active, intelligent, and competent builder is thus one of our most efficient sanitary reformers. Nor has it been left to private enterprise alone to provide for the pressing necessities for the labouring poor. The comfortable and healthy homes provided by our local Industrial Dwellings Company form an immense contrast to the wretched abodes in their immediate neighbourhood, where death holds a perpetual carnival; and, for the sake of the moral and social results, it is to be hoped that the public spirit which has inaugurated the movement will not fail of its financial reward. In London, where attention has been paid to the wants of a locality, such dwellings have proved in every respect a success, and, as an investment, are justly regarded by many as one of the safest in the market. Nor is there any reason why it should be otherwise in Newcastle."

And again,—

"Poisonous emanations from decaying animal and vegetable substances are favourable to the production of diarrhœa; and it is impossible to resist the conviction that the wretched and filthy condition of the miles of unpaved streets then to be found in that sub-district were likely to be conducive to that excess. Leaving out of consideration the mortality from phthisis in the sub-district of St. Nicholas and St. John, which includes the deaths in the Infirmary, a comparison of the other sub-districts shows a death-rate from phthisis in Westgate and Elswick, during 1866, of 327; St. Andrew, 310; Byker, 278; and All Saints', 257, in 100,000 persons living. The principal conditions somewhat under municipal control, conducive to the development of tubercle in the lungs, are want of pure air, want of sunlight, and damp; and while each of these causes in varying degrees operates in every registration sub-district, it can scarcely be doubted that the high mortality from consumption, during 1866, in a sub-district like Westgate and Elswick, upon the whole the healthiest of the borough, was largely dependent upon its 155 unpaved and unsewered streets. The vapours of marshy lands are known to favour the deposit of tubercle, while it is often arrested by living on a dry soil and in a uniform and temperate climate. The mere removal of subsoil water by complete drainage, to some extent accomplishing both objects, was found, in our experience of 1866, in a considerable degree to diminish the mortality from consumption; and the enlarged and enlightened observations of Dr. Buchanan had established it as a sanitary law that the drying of the subsoil reduces the death-rate from consumption, and the experience of the west end of Newcastle since 1866 is not the least striking illustration of the truth of that law. The great reform in the street condition of that sub-district during the last three years can only be truly estimated by those who lived in its midst before. Justice cannot be done to it in any description. The melancholy mud ocean that enveloped so many hundreds of work-people's dwellings has given place to well-paved and sewered streets. The death-rate from diarrhœa and consumption has been steadily lessened; and when the street and sewer works are finished, the west end of Newcastle will bear favourable comparison with some of the healthiest districts in our large towns."

Mr. W. Crozier, C.E., gave the town excellent encouragement to proceed, by an account of

What has been done in Sunderland,

and the satisfactory results that have followed. Mr. Crozier said:—"There has been expended from the year 1851, up to the present date, in the borough of Sunderland, as follows:—

* The *Irish Builder* in a recent number says:—"Reverting to Mr. Godwin's remarks about the sanitary condition of the town of Newcastle-on-Tyne, we can bear him out in every particular. He has hardly spoken strong enough of the deplorable state of the low quarters of that commercially prosperous but sanitarily misgoverned northern capital. We speak from personal knowledge ourselves and of repeated visits made to 'Canny Newcastle.' It is to be hoped that the action of the Social Congress held during the last few days in the town, will wake up the civic authorities of Newcastle to look closer after the courts or 'chares' as they are called in that town. Round about the Ouseburn quarter, along the quay side, and through the heart of the Sand Gate, there is at present and always has been, a plentiful supply of dirt, disease, and, of course, absence of pure air. We make those remarks in justice, and in confirmation of the speakers whose remarks we append."

On Sanitary Works (current).....	£288,000
Ditto Ditto (permanent), including Sewerage, Baths and Washhouses, Public Flagging, Private Flagging, Public Park, and pulling down old property under the Act of 1867	230,000
Private Sewerage Works.....	150,000
	£668,000

And upon works which can hardly be classed as sanitary works, such as markets, bridge, police stations, fire-brigade, &c., 79,270*l*. It is also proposed to expend 40,000*l*. more in pulling down old property, 5,000*l*. in public flagging, and 10,000*l*. in extension of the sewerage works. The only liabilities which remain to meet, out of this great expenditure, is a mortgage debt of 195,000*l*. As to the beneficial results obtained in the health of the town, these are clearly shown by the registered rate of mortality from the year 1841 to the present time, which is as follows:—In 1841, the rate of mortality was 26·89 per 1,000; in 1851 to 1858 (inclusive), 26·00 (before sanitary works were completed); in 1858 to 1868 (inclusive), 24·00 (after sewerage works were completed, but no dwellings dealt with); in 1869, 22·80 (ditto); in 1870 (half of year), 19·5. Since the paving and sewerage works have been carried out, there has also been a marked improvement in the cleanliness of the interior of the dwellings of the poor. The Public Lodging-houses have been closely and strictly attended, the necessary cubic space and all necessary rules rigidly adhered to, and the mortality in the lodging-houses is actually less than in the ordinary dwellings of the working classes. One matter which I am bound to admit is greatly in favour of the borough of Sunderland, is its abundant, constant, and splendid supply of water, which never fails: every house and tenement in the borough has an ample supply, and yet, by a constant supervision exercised by the water company over the fittings used, and the detection of waste, the consumption for private purposes is only 13 gallons per head of the population, exclusive of water for manufacturing purposes, and rather under 20 gallons, including the same. In laying before you these few facts, I have referred, for the sake of showing what can be done, and what is often either left undone or too long delayed, to the boards and works of two of our largest local boroughs. But, as in all matters that are to be inquired into, it is only by such references that we can arrive at conclusions which may be useful hereafter for our future guidance, I trust that any remarks I have made will be received in the spirit in which they were intended,—that is, with no intention on my part either to condemn or approve the proceedings of any public body, who, I am sure, always do what they consider best for the interest and welfare of their different boroughs, but to endeavour to arrive, as far as possible, at facts, which may be of use in further carrying out sanitary reform, the yet great question of the day, but which, I am sorry to say, has, for the last twenty years, been more treated by words than works. After the works above enumerated have been carried out in a town, including the removal of uninhabitable, and the substitution of an improved class of dwellings, paving and flagging, baths and washhouses, public parks, an abundant and constant supply of pure water, and a proper system of sewerage, which, I am of opinion, is the best means of bearing away the soluble refuse of our towns, there is still left, before our sanitary works can be said to be complete, a great and important work to be done, viz., the disposal of our sewage matter, so as not to pollute our rivers and harbours, and to endeavour, if possible, to turn the matter so disposed to some profitable account."

We may not, however, devote to this subject more space at the present moment, further than to urge the authorities to give their serious attention to the suggestions that were made, and to offer them assurances which we hope they do not need that we have ourselves, in pressing upon them the necessity for further improvements, but one object in view,—the general welfare.

Flies.—A little attention on the part of the proprietors of dining-rooms would get rid of the evil of flies. In Belgium the butchers use laurel oil on their door-posts and window-frames, to such good effect, that the flies will not enter the shops. Is not this hint really worth taking?—*Food Journal.*

HOW WE BUILT A SHIP TO SINK.

The grave, pointed, and well-considered censure which the Court of Inquiry into the circumstances attending the loss of H.M.S. *Captain*, with 500 of her officers and crew, off Cape Finisterre, on the morning of the 7th of September, has had the courage to embody in the judgment read by the Judge-Advocate on the 8th current, deserves the very serious attention of educated men. That two admirals and seven captains of the Royal Navy should have so conscientiously discharged the judicial function to which they were summoned, unbiassed by any of those considerations of personal favour, or hopes of employment or promotion, that are thought to be forfeited by uncourtly remarks as to the conduct of administrative superiors, is in itself a circumstance that does them honour. The Court, after finding, as the public were fully prepared to anticipate, that no blame is attributable to Mr. James May and the other survivors of the *Captain* (the *pro formâ* prisoners before them) for the loss; and having put on record the somewhat bald statement that the vessel "was capsized by a pressure of sail, assisted by a heave of the sea," and that the "sail carried at the time of her loss (regard being had to the force of the wind and the state of the sea), was insufficient to have endangered a ship endowed with a proper degree of stability," emphatically state their conviction, which resulted in their minds from the careful consideration of the evidence. They remark that the *Captain* was built in deference to public opinion, expressed in Parliament and through other channels, and in opposition to the views and opinions of the Controller and his department; and that the evidence all tends to show that these officers generally disapproved of her construction. They state that while in the hands of the contractors who built the *Captain*, a grave departure from her original design was committed, by which the draught of water was increased, and her freeboard was diminished, by about 2 ft. And they add that her stability proved to be dangerously small, combined with an area of sail (under the circumstances) excessive. Thus far, indeed, the facts brought out in evidence admit of but little difference of opinion; nor would the late Controller, or any administrative officer of the navy, have hesitated to sign such a judgment. But the sting is to follow. The Court deeply regret that, if these facts were known and duly appreciated, they were not communicated to the officer in command of the ship; or, if otherwise, that she was allowed to be employed in the ordinary service of the fleet before they had been sufficiently ascertained by calculation and experiment. If this is not something like a verdict of manslaughter against the Admiralty, we fail to read the meaning of very plain English.

We are not of the number of those who will rejoice to make use of this grave and serious impeachment as a political weapon against the present Commissioners of the Admiralty, or the Government of which they form a part. For us, as for the majority of our readers, the interest lies far deeper than any party question. Neither would such an application of the blame be altogether just. The "yielding to the pressure of public opinion expressed in Parliament, and through other channels," can hardly be considered as a crime in itself. It is in the mode of such yielding that the gravamen consists. To introduce, experimentally, a pattern of floating battery which had very strong recommendations in its favour, while (whether truly or otherwise), it was generally believed to be opposed, rather to the private interest, or private hobbies, of Government officials, than to any structual law, was a departure from the rules of red tape that would find more to applaud than to condemn. But the sore point lies here. In so disregarding the opinion of the responsible officers, the Board of Admiralty was bound to guarantee their own action by the independent advice of some engineer of sufficient eminence to justify them in case of failure. Had this been done, the Admiralty would have been placed in a very different position. For, in the first place, the loss would not then have occurred. No such civil engineer as were those great men whom, a quarter of a century back, the Admiralty would have consulted in a similar case, would have allowed the *Captain*, as she was actually built and rigged, to go to sea. Secondly, if any disaster, even of a less unmistakable character, had occurred after such a step, My Lords would have been held blameless. They might have said with justice that the great importance of the subject, the military advantage to be gained in the event of success, and the favourable opinion of many skilful men, had convinced them that the experiment should be made. That, having so decided, against the wishes of their own constructors, they had taken the independent advice of a competent professional man, and that, on his assurance of the safety of the plan, they had ordered the experiment to be carried out. Further that, during the progress of the construction, this *ad hoc* consulting engineer had, from time to time, given the requisite attention, to see that the design was faithfully adhered to. Had this been done, no complaint would have been urged against the Admiralty in case of non-success.

It is very clear that it is not the present Board of Admiralty that is to blame for omitting, in the first instance, this obviously necessary precaution. That they should have allowed the *Captain* to put to sea, under all the circumstances that have since been made public, was, no doubt, a grave fault. Still the present administration did no more than allow the matter to run on in the groove in which they found it actually in motion; and it may be even urged that it is to expect too high a grade of education for merely political men to imagine that a First Lord would even entertain the idea that a vessel would be so designed and so built as to be liable to capsize. Such, no doubt, is the case. While, therefore, the absence of a proper consultative officer shows a want of proper precaution, which is in itself inexcusable, it is not so easy to say that Mr. A. or Lord B. is personally responsible for the omission. The evil, to a great extent, is chargeable to the system of our political administration. While we are content to commit military, naval, and technical matters to civilians and non-technical men for political reasons, we shall be likely to pay the price of the *Captain* at least once a year. Happy would it be for us if it were the material cost of the vessel alone that was in question, and not the loss of the very flower of the navy, the noble youths and stalwart sailors that were caught, in a moment, in that deadly trap.

In giving minute attention to the evidence brought before the Court, it is impossible to doubt that the main question was, whether purposely or not, kept in the background. Whether the cloud of words in which it was obscured arose from the fact that the witnesses purposely shunned the light, or from the circumstance that they had not that definite mechanical knowledge which would have enabled them to make the matter clear, we can offer no opinion. But the two separate (though intimately related) questions of height of freeboard and position of centre of gravity were so confused that as yet we have no hesitation in saying the public in general are quite unaware of the real cause of the loss of the *Captain*, and, consequently, of the fact that that loss was not what can properly be called accidental.

In all sea-going craft it is a primary necessity to provide that the vessel shall be able to right herself, in the case of being laid on her beam-ends in a sudden squall. The precaution against permanent overthrow is twofold. First, the centre of gravity of the vessel must be kept so far below the centre of gravity of the bulk of water displaced as to insure the vessel's floating, in normal circumstances, with the keel down and with the deck up. Secondly, the cross section of the vessel should be such as to make the resistance to overthrow the greater the more the vessel is inclined to her side,—greater, for instance, at an angle of 15° than at an angle of 10°, greater at 20° than at 15°. This requisite involves a certain height of freeboard.

It must, however, be borne in mind, that in calculations of this kind we have been in the habit of regarding floating bodies of homogeneous nature. In the case of a ship built altogether of timber, or altogether of iron, the height of the freeboard may be regarded as the primary element of stability. If the line of the hull be so designed that the displacement continually increases,—that is to say, that more and more water has to be lifted, the more the vessel heels,—we have a force ever acting in the right direction, and one which, under almost all conceivable circumstances, will get the better of the fitful fury of the wind. But if the vessel be constructed of different materials,—if the upper part, for instance, be of iron and the lower part of wood,—this righting process vanishes. The difference of the specific gravity of the upper part of the vessel, compared with that of the

water, is so great, that the effect of the increased displacement is disproportionately less than that of the leverage of the ponderous side-wall of the vessel. And as, under these conditions, the centre of gravity of the vessel approaches the level of the centre of gravity of the water displaced, stability becomes questionable, or altogether disappears.

Thus, in the height of the freeboard of the *Captain* we have but one of the elements of her floating qualities. She drew, we are told, 2 ft. more water than was designed. If the effect of this deeper draught had been to keep the centre of gravity well below the indicated line of safety, the greater draught would have been in her favour. The mere presence of a higher freeboard of heavy plates would not have compensated for the disadvantage of a centre of gravity varied to an equal extent. This matter must be obvious to any one who has swum a pail in a pond, but it has been kept out of sight in the evidence.

Nor has any light been thrown on the subject of the cause of the excessive weight. It was given, we are told, to strenghen the vessel; but the calculators were throughout so much in arrear of the construction that all this part of the affair is most unsatisfactory. We should like to know how the vessel was paid for, and what was the character of the specification. Eight hundred tons additional ironwork is no trifle. We know nothing of the schedule of prices of the *Captain;* but, according to Admiralty schedules with which we are acquainted, it would represent an extra cost of 36,000*l*. Are we to suppose that extras of this kind, amounting to more than 25 per cent. on the entire weight, were to be sprinkled in at the pleasure of the constructors, and paid for by the public, after the design had been approved, and the vessel ordered? In any case, the need of that independent and competent supervision, to the absence of which the disaster is directly attributable, is only the more glaringly shown by such admissions as these.

The object of the construction of the *Captain* was one of the highest military importance. As a floating battery, it is probable that the lost vessel was unrivalled. That for purposes of harbour and coast defence the freeboard might, with advantage, have been yet further reduced, had all idea of ocean navigation been abandoned, is more than probable. The idea of raising and lowering the vessel bodily in the water, by the admission or the removal of water ballast, is one that has much to recommend it. The convenience of carrying guns of the great power of 600-pounders, in revolving turrets, framed of 10-inch iron, protecting the gunners with something approaching absolute security, while at the same time a line of some 6½ ft. deep was alone presented as a target for the enemy, is extreme. So admirable a design for a battery may well be coveted for a sea-going ship. We cannot hold that the loss of a vessel of the kind, built without calculation and without supervision, should be deemed conclusive, as against the seaworthiness of every possible form of turret-ship. In the turrets, themselves structures of such enormous weight, and placed necessarily so much above the centre of gravity of the vessel, lies, no doubt, a great element of instability. It is possible that this element can only be mechanically compensated in a vessel of a larger size than any we have yet discovered the possibility of constructing for war purposes. But we deprecate the abandonment of the attempt to build a sea-going turret-vessel, as strongly as we deprecate the construction of turret-vessels which are not sea-going,—that is to say, with any purpose of sending them to sea.

The questions of tripod or jury-masts, and of the greater or less spread of sail borne by the *Captain*, important as they are, are of less moment than the question of the position of the centre of gravity. As to the fatal error committed on this score, the evidence does not leave the shadow of a doubt. Mr. Barnaby, the president of the council of construction of the controller's department of the Admiralty, furnishes some figures on this head. On the 26th of February, the Lords of the Admiralty ordered that "steps should be taken to ascertain the vertical height of the *Captain's* centre of gravity." It was, however, somewhat anomalously resolved that the trials of the steaming properties of the vessel should be made before this precise element of stability was ascertained. That this had not been previously attempted, however roughly, by calculation, is one of those facts for which we fail to find any excuse. It was not until the 29th of July that the *Captain* was actually inclined, by placing weights on her deck, in order to ascertain the position of her centre of gravity by calculations based on the experiment. The calculations were not complete, and the position of the centre of gravity was unknown to the constructors, until the 23rd of August,—the vessel having been allowed to proceed on her cruise, in the absence of this knowledge, on the 4th of August. From this trial it was ascertained that the centre of gravity of the dip was situated at a depth of 2·9 ft. (two feet and nine-tenths) below water. The distance between this point and the meta-centre, if Mr. Laird is correctly reported, is given at 2·6 ft.; but, as no information is given as to the amount of displacement, either when the vessel was vertical or at any angle of heel, we are not furnished with the means of applying the formula of stability of equilibrium to the case. Still, if the evidence be correctly reported, it would seem as if, but for the unexpectedly deeper draught of the vessel, the centre of gravity would have approached within 9 in. of the water-line, instead of being one-third below the line of flotation and two-thirds above the kelson. As the ship was actually built, it appears (assuming both calculation and report to be correct) that her maximum stability was attained at an angle of heel of 21°, when it was represented by 7,100 foot tons. From this very moderate inclination, which is more than three times that arrived at by actual experiment, the righting force diminished. The edge of the deck would have been immersed at an angle of 14°, when the righting force was stated to be 5,700 foot tons. How far the deck would have been immersed at the angle of maximum resistance is not stated. At 31½° the righting force had sunk again to 5,700 foot tons, and at 54½° it vanished altogether. The opinion appended to the statement of these facts that the reporter "did not think the *Captain* was unsafe," has been subjected to a grim and terrible rebuke. But even for these calculations, completed nineteen days after the *Captain* sailed, and just six months after they were ordered by the Admiralty, it seems that the only data obtained were those derived from placing 80 tons of ballast on the deck, causing an inclination of 6°. On this we are told that Captain Burgoyne said, "This ship is not difficult to get over 6°, but beyond that she will not go." The Assistant-Constructor replied that an additional 80 tons of ballast on the upper deck would cause her to go over to "about double that inclination." It would hardly seem as if the latter statement was much less of a shot in the dark than the former.

The subject is one which eminently concerns the profession of civil engineers. The high position which was held by some of the leading men of what we can hardly call the last generation is vacant. Men seem never to think of guiding themselves by such advice as was given by James Walker, by Robert Stephenson, by Isambard Kingdom Brunel. The collapse of the artificial system of contractor-built railways has involved a noble profession in a downfall, which, if in individual instances it may have been merited, is, nevertheless, a great loss to the public. In the whole of the proceedings as to the calculations and the construction of the *Captain;* the increase of the ironwork of her hull from 3,000 tons to 3,800 tons; the absence of correct theoretic calculations as to the flotation of the vessel; the actual and dangerous position of the meta-centre; the limping of experiment, calculation, and report, after the actual ocean path of the great battery; the declining of responsibility from Admiralty officers to contractors, and from contractors to My Lords; and, worse than all, in the final catastrophe, may be traced one clear and important lesson,—the *Captain* has been lost from the neglect to employ a competent consulting engineer.

Nor is the lesson less signal for the public and for the leaders of the public. Vehement advocates, in Parliament and in the press, for reasons the propriety of which must absolutely depend on scientific taste, may learn—if they can learn—a little modesty from the catastrophe of the *Captain*. Without admitting that the Admiralty have any excuse for failing to take proper advice, we may yet do well to remember, in the words of the Judgment rendered by the Court of Inquiry, that the construction of a vessel disapproved of by the permanent scientific officers of the navy was forced on the Board by popular clamour. At a time when it is becoming a prevalent doctrine, notably in some parts of the Continent, and increasingly even in England, that the less highly a class of men is endowed with the advantages of a liberal education, or, at least, the further it is below the position which can command these advantages, the more potential should be its voice in political questions, it is of extreme importance to observe what overwhelming calamity may, and we believe must, result from the application of the theory. From want of thorough knowledge, in more quarters than one, of the first requisite of a sea-going vessel, our finest floating battery has been sent to the bottom like a shot. We may not have paid, even in this sad and sorrowful event, too heavy a tax for our national safety, if we learn in time the danger of applying the same system, or rather the same no-system, to the erection of our public buildings, the direction of our army, and to the general defence of the country.

BUILDING IN A HURRY.

One of the most distinguished of the architects who aided in stimulating the Gothic revival in England, when asked, by a committee sitting on the plans of a proposed cathedral, for an estimate of the cost of the building, "for all reply" (as the French would phrase it), rolled up his drawings, and carried them off; and when

"With the morning cool reflection came,"

explained his behaviour by protesting that he could not deal with people who were silly enough to ask the "cost" of a cathedral, the building of which would, or ought to, extend over more than a life-time, and through all kinds of possible fluctuations in the labour market. This was, perhaps, carrying matters a little too far; and, moreover, it is not unlikely that the sentiment was based, not so much on a consideration of what modern builders could possibly accomplish, as on an illogical idea that since the building of a Mediæval cathedral generally extended over at least two or three generations, a modern one had no business to get itself built any quicker. More recent architects, Gothic and Classic, have at all events got out of this little superstition, or the public have worried them out of it. We are a business-like people, and whether the order is for a pair of soles under one's feet or a roof over one's head, the purchaser always wants to know "how soon he can have it." And it must be conceded that, in a business point of view, the demand is well met. Architects are ready to turn out plans for a town-hall or a monster hotel, by the aid of an efficient staff, in a wonderfully short space of time; and contractors, with an army of workmen and an imposing array of "plant," are prepared definitely to "name the glad day" when the work can be handed over complete and in good order, for the use and occupation of those who require it. In some respects, and in some cases, this rapidity and certainty in carrying out work, the result of modern improvements in communication, transit of materials, machinery, and in the organisation of labour, is an incalculable advantage. Where a building is wanted mainly for certain pressing practical needs,—where it is necessary, for instance, to build a hotel to meet the rapidly-increasing popularity of some special neighbourhood—in such cases it is almost essential to be able to state an early date when the work shall be in readiness, more especially when there are anxious shareholders who wish "to see something for their money." And in any case it would be absurd to ignore the necessary result in the building trade, as in other trades, of improved mechanism, material and social; or to suppose that because a great architectural style was developed under a slow and uncertain *régime* of building operations, the two facts were therefore to be regarded as in the relation of cause and consequence. But whilst all saving of labour is, in the main, so much to the common weal, there are, in regard to the practice of modern architecture, certain drawbacks attendant upon the greater facility with which large building operations are carried on, which it is as well not to lose sight of. Practical drawbacks there are, for instance, which, as they affect chiefly the comfort and health of the future inhabitants of a building, we may ask non-professional as well as professional readers to take into account. These nowhere show themselves more than in the erection of dwelling-houses, as frequently carried out, especially houses for the middle-class in point of wealth, who do not support more than one residence, and who, if they build a house, do it as one of the great events of their

lives, not to be approached or even entertained without due caution and deliberation. But, once decided on, the feeling is that of Macbeth, "if 'twere well done, 'twere well it were done quickly." In many cases, our client is a recently married or an about-to-marry man, bent on making a domestic homestead for himself and his descendants: and he must have the house ready by a certain date, because he is coming home from his travels at that time, or because of some interesting domestic prospects, or because he is constitutionally impatient; and so the house is planned in a hurry, and subsequent modifications have to be made for which no thought had been taken at first; and the bricks or stone are chosen in a hurry, and the former turn out to be friable and efflorescent, and the latter green and pervious to damp,—*n'importe*, the house must be ready, and so the joiners and plasterers are turned in upon the hardly-finished carcass, and the consequences are seen before long in "sweating" wall surfaces, and mottled ceilings, and decaying paint or paper. It is seldom that an ordinary middle-class dwelling-house is built as deliberately as it ought to be, in order to ensure good and permanent work. To do strict justice to a house, the shell should be built and left to stand for some months, till thoroughly air-dried, and till all the superfluous moisture has found its way out of the walls before its exit is obstructed by plaster and skirtings. But this would in general involve far too great a delay for an anxious and impatient client. Artistically, too, the house must suffer, since there is no adequate opportunity for considering the design of the fittings and furniture, which ought to correspond with the style of the building; but these are points so seldom actually considered by a house architect, and to which his client is in general so totally indifferent, that they may be practically left out of account in regard to English dwelling-houses. It is probable that were double the time and trouble expended over the actual building of the house, the owner would still fill it, as usual at present, with carpets and furniture bought from upholsterers' stocks, and of no style of design in the world.

In buildings on a larger scale than ordinary dwelling-houses, there is of course in hurried building the additional practical danger from insecure foundations and unequal settlement of work hurried up at an undue speed. In the matter of foundations, however, so much can be effected now with concrete, that where expense is no object, and time is, there may be less occasion for deliberating and experimenting on the nature of the site. But the most important prejudicial effect of hurried building, though one to which the public generally are quite indifferent, is seen in the architectural design. There are, unhappily, a large number of architects who are as careless in this matter as their clients, or who have no idea of it being necessary to study carefully the design of a large building; if they can turn out showy drawings in the prevailing fashion of the day, and set clever carvers to work upon the building, they have satisfied equally both themselves and their clients. And these are the class of architects who are most in favour with hotel companies and other speculators in large buildings; they are regarded as good men of business, and praised for their readiness and despatch. In the meantime those architects who wish to produce buildings that will be both durable and permanently satisfactory in effect are somewhat unfairly treated; the pace is set by the rapid and ready school of men, and the more careful and conscientious must either keep up to it, or be content to lose commissions which they can ill afford, either for their gain or reputation, to see go into other hands. So it comes to pass that a man who would be very glad, if he could, to give careful consideration to every detail of a building, finds himself with several large works on his hands, all required to be completed as soon as possible, and the result is a scramble in which details and all those subtleties of style and treatment which go to make up the charm of a really artistic building are left to chance and the clerk of works or draughtsman. There are very few large buildings to be seen which do not show in their treatment of detail evidences of disproportionate haste and consequent want of attention on the part of the architect, who is really not in general to blame in the matter, since he is hurried on by the demands of his clients. The architect of such buildings as the Law Courts and the Manchester Townhall (for example) ought to be so remunerated and so considered with regard to demands on his time that he could afford to give study to all the detail in its relation to the whole. Instead of this, too many buildings bearing the name of unquestionably talented architects bear also on their face the testimony that their ostensible author could have had but a very limited share in producing them, and that the details are just the current office stock of features (and we know how different offices run into mannerisms of their own), applied in a mechanical manner by a staff of draughtsmen, to the design which their chief has broadly sketched out, but had no time to work out in detail. No really satisfactory building ever was or will be produced in this manner; and we could point to several large buildings at this minute which convey to the spectator the idea that they are the conglomeration of the work of several designers thrown together at hap-hazard. Between the slow growth of a Mediæval cathedral and such a flinging together of materials as in Beckford's attempted tower at Fonthill, which was carried up day and night by the aid of torchlight and relays of workmen, and fell down the moment it was completed, there are many gradations of haste or deliberation; and there may be occasions when speed really is of the first consequence. But, in a general way, the public and the Government ought to understand that neither stable construction nor good architecture is to be had in a hurry; and that if they want really good work for their money, they must give their architect time to think and their building time to settle.

COLOUR IN STAINED GLASS.

One of the most remarkable movements ever recorded in Church history, but one that has scarcely received the notice which it deserves from modern writers, was that which was commenced by a few Benedictine monks in the east of France, at the close of the eleventh century. Disgusted with the laxity of manners which had overspread monastic institutions, and scandalised with the ostentatiousness and extravagance displayed in the buildings, decoration, ministration, and services of the Church, three monks of the Abbey of Molesme, desirous of following a stricter mode of life, and of adopting a simpler and purer form of worship, separated themselves from the community to which they belonged, and founded, in a desert place in Burgundy, a new convent and a new Order of Monks.

Such was the commencement of the great Cistercian Reformation, which, rapidly overspreading the whole of Christendom, in a wonderfully short space of time covered the face of Europe with its results, no less than 350 abbeys of this order having been founded, erected, and abundantly endowed within the first century of its existence. In no country did this reformation, and the simple earnestness of its promoters, meet with greater favour and readier acceptance than in England. Landowners and nobles vied with one another in offering sites for their convents, in aiding them to raise their Abbey church and their domestic buildings, and in amply endowing them when completed: witness the numerous noble remains of this Order in Great Britain, which still survive the disastrous effects of a subsequent Reformation, due to similar causes, the destructive ruthlessness of which swept away much that was noble and admirable, as well as much that was corrupt and degenerate.*

Again and again has the same thing happened. We see it in the outbreak of the Iconoclasts, in the early ages of the Church, and in their wholesale destruction of images and pictures; as well as in the subsequent separation of the Greek and Latin Churches due to the same causes. We have it again in the protests and secession of the Cistercians in the eleventh century, and in the action of Wycliffe and his followers in the fourteenth. We see it later still in the German Reformation of the fifteenth century; in the suppression and destruction of monasteries under Henry VIII., and in the puritanical havoc of the great Rebellion.

In this frequent recurrence of the same causes and the same effects, from time to time, in the history of the Church, we recognise, in the first, the natural proneness of human nature to that which captivates the eye and pleases the senses, and the constantly increasing tendency to ornate services, to church decoration, to a sensuous ritual, to pictures and images, and ultimately to superstitious observances, and saint-worship; and we see, in the second, the sure result of that revulsion of feeling which suddenly arises when the lowest point in this downward progress of mental subserviency is arrived at.

Of these different movements in the latter direction, not one was commenced and carried out with so much humility and gentleness of spirit as that of the Cistercians. Content to protest and to dissent, they proved the sincerity of their professions by the sanctity of their lives, and by the reality of their self-denial, rather than by aggressive attacks on the system which they condemned. In no document, however, either of ancient or modern times, is the use of colour and gilding on walls and windows, of gold and silver in ornaments and utensils, of pictures and images, of superstitious practices, and saint-worship, so emphatically denounced as it is in the Charta Caritatis of the Cistercians, the code of laws which, adopted in the earliest days of the foundation of the Order, and subsequently enlarged and confirmed under the auspices of St. Bernard himself, remained the rule of life of all the monasteries of the Order.

The manly independence which characterises this early protest or charter is sufficiently remarkable, when we consider the circumstances and the times in which its authors lived. Without throwing off their allegiance to the Church, they acknowledged no authority in the administration of their affairs, or the government of their own monasteries, but that of the head of their Order. They forbad, indeed, their members to go to Rome, unless accompanied by a bishop of the Cistercian Order.[a] They prohibited prostration in their churches, and any abject position of the body whilst praying.[b] They abolished saint-worship, and permitted their churches to be dedicated only to the Blessed Virgin.[c] They tolerated no images, or pictures even, of saints; nor, indeed, the representation of the human form on their walls, or in their windows; nor even the crucifix itself; permitting only a painted wooden cross.[d] This order is further supplemented, and their opposition to all approach to sensuousness, either in their service or ritual, is farther illustrated by a comprehensive order passed at the General Chapter of 1213;[e] and again by two remarkable injunctions relating to bell-ringing and singing, occurring, the first, in the same general order of 1213, and the second in the second edition of the Charta Caritatis of 1134.[f] Their objections to polychrome, and to richness of ornamentation of every description, arising evidently from the extent to which the abuse of this species of decoration on the walls, and in the vestments and utensils of the Church, had been carried, are emphatically conveyed in their various prohibitions on this head, which descend even to the clasps of their books and the lettering of their manuscripts.[g] Lastly, we have the following remarkable order in regard to stained glass:—Cap. lxxxii. "Vitreæ albæ fiant, et sine crucibus, et picturis." Strong colour is to the eye what strong drink is to the palate; and we gather from the strength of the remedy in this case what must have been the extent of the disease at the time when these rules were drawn up. Nothing short of *total abstinence* having been considered by the Cistercians of that day, as by the Temperance Societies of our own time, to be likely to be effectual.

That these rules, and others, which regard

* Amongst English Cistercian abbeys of the first class are to be reckoned the following:—Fountains, Furness, Kirkstall, Byland, Rievaulx, Jervaulx, Tintern, Netley, Beaulieu, Buildwas, Kirkstead, and Croxden.

[a] Cap. lxxvi. "Nemo nostri Ordinis Romam eat, nisi cum Episcopo sui Ordinis."

[b] Cap. lxxxvi. "Non est nostræ consuetudinis monachum, vel conversum prostratum . . . . . corpore jacere in oratione, sed super genua, vel stando."

[c] Cap. xxi. "Decernimus ut omnes Ecclesiæ nostræ, ac successorum nostrorum in memoriâ terræ Reginæ, sanctæ Mariæ fundentur, ac dedicentur."

[d] Cap. xix. "Sculpturæ, vel picturæ in ecclesiis nostris, seu in officinis aliquibus Monasterii, ne fiant, interdicimus. Cruces tamen pictas, quæ sunt ligneæ, habemus."

[e] "Superfluitates, et curiositates notabiles in sculpturis, ædificiis, pavimentis, et aliis simil.bus quæ deformant antiquam Ordinis honestatem, in Abbatiis, grangiis, vel cellariis nostris ne fiant interdicimus."

[f] Cap. xii. "Campanæ Ordinis nostri ita fiant ut unus tantùm pulset eas, et nunquam duo simul."

Cap. lxxv. "Viros decet virili voce cantare, et non more fœmineo, tinnulis, vel, ut vulgo dicitur, *falsis vocibus*" (*i.e.* falsetto).

[g] Cap. x. "Omnia Monasterii ornamenta, vasa, utensilia sine auro, et argento, et gemmis, præter calicem et fistulam, quæ quidem duo sola argentea, et deaurata, sed aurea nequaquam, habere permittimus."

Cap. xiii. "Interdicimus ne Ecclesiarum nostrarum libris aurea, vel argentea, sive deargentata vel deaurata habeantur retinacula, quæ usu *firmacula* vocantur."

Cap. lxxxii. "Litteræ unius coloris fiant, et non depictæ."

exclusively the architecture of their buildings, and which, as not applying to the matters in question, I have not here referred to, were strictly observed during the first two hundred years of the existence of the order, there is little doubt. And although, in consequence of the almost total disappearance of the Order, and the alienation or state of ruin in which the whole of their buildings exist at the present time, there remain little or no traces of their decoration or furniture, yet I can vouch for the fact,—having visited the remains of all the chief abbeys of this order in France, England, and Germany,—that the instructions of the Charta Caritatis in regard to their architecture were strictly observed during these two first centuries; and we may therefore conclude that, in the matter which interests us,—namely, their wall decorations and their windows,—there was the same uniformity of observance.

Singularly enough, however, the most beautiful stained glass that I ever beheld, I saw in the ruined abbey-church of a Cistercian monastery, in 1832. It was designed, in all probability, just at the time when the severity of the rules of the Order in this respect, as also in others, began to be relaxed. The abbey of which this church formed a part was founded in the year 1133, at Altenberg, near Cologne, by Eberhard, Count of Berg, whose descendants rebuilt the abbey-church, from the designs and under the superintendence, it is said, of Erwin von Steinbach, the architect of Cologne Cathedral, in the latter part of the thirteenth century. At the dissolution of the monasteries, the abbey was converted into a manufactory, and suffered from a fire in 1815, which destroyed the conventual buildings and injured the church; but when I visited it, in 1832, the church, though roofless and in ruins, still retained the whole of its magnificent Geometrical windows, filled with the most elegant stained glass. The Prussian Government has, I believe, since restored the roof and repaired the church, and, it is to be hoped, has thereby saved the glass. The design of the building, which, from its windows and moulded detail, belongs, evidently, to the period ascribed to it, bears in every part the impress of its Cistercian origin,—simplicity and elegance of design being its chief characteristics. It is lofty and of noble and stately proportions, but entirely devoid of all florid ornamentation; what carved work there is is chiefly in the pier-capitals, having much gracefulness in its composition.

It is, however, to the stained glass of its noble windows that I desire to call the attention of those who are interested in the subject we are considering. It is scarcely necessary to say that they contain no "pictures," and no patches of gaudy colour. They consist, in fact, exclusively of designs of foliage, arabesques, and diaper-work of the greatest elegance, and of infinite variety, arranged chiefly in geometrical patterns, executed in grisaille, and other light colours; and belong in all probability to the latter part of the Period in which the church was built,—that is to say, to the latter part of the thirteenth and the commencement of the fourteenth century; in other words, to the very best Period of Christian Art.

Of the artistic nature of these designs, and of the admirable manner and material in which they are executed, it is impossible to speak too highly. Of even feminine fairness and gracefulness, they surpass, in my opinion, all the examples of this kind that we have in this country, not excepting the Five Sisters of York; and if, in the matter of stained glass, it were desired to select works of art that would most fitly typify and represent the purity and simplicity of Anglican worship, I should not hesitate to indicate the windows of Altenberg Abbey Church as the models we should adopt. In such a case as that of Salisbury Cathedral, for example, where nearly all the windows are of common white glass, if the Dean and Chapter, instead of permitting them to be filled one by one, at rare intervals, by "private munificence," at a great cost, with deeply-stained glass of the kind usually supplied by glass-stainers at the present time, were to adopt some general plan by which the whole of, or at least the lower windows of, the cathedral might be filled, in the course of a few years, by public subscription, with stained glass of really artistic and graceful design, and of the character of the windows of Altenberg Abbey Church, enriched with smaller portions of deeper colour, introduced sparingly and in the gem-like manner already alluded to, an admirable work might be accomplished, at one-third of the cost and in one-fifth of the time that would be otherwise required, which would mark the commencement of a new era in the art of glass-staining in this country. For it is hardly to be doubted that an example thus set, by which it could be shown that works of real art, more in harmony with the character and spirit of English worship, could be produced at a cost which would bring them within the reach of all church-restorers and church-builders, would be rapidly followed, in this progressive age, by the almost universal adoption of a mode or fashion, which, offering a happy medium between the painful glare of common glass, and the gaudy sensuousness of a typical memorial window of the present day, would be assuredly recognised in the latter part of the nineteenth century as a considerable improvement on that which prevailed during the earlier part of the same century.

I need scarcely say, in conclusion, that were such a fashion to become prevalent, the argument in favour of extravagantly-coloured wall-decoration, based upon the present use of deeply-stained glass in our windows, would naturally fall to the ground. Edmund Sharpe.

THE NEW INFIRMARY BUILDINGS FOR EDINBURGH.

The plans for the new infirmary on the grounds of Watson's Hospital, at Edinburgh, are now in the hands of the managers. The foundation-stone of the buildings is to be laid with full Masonic ceremony by the Prince of Wales.

The general scheme adopted by Mr. Bryce is that of the Pavilion system. In the site he found the advantage of a southern exposure, together with a sloping surface, which admitted of buildings being so placed that those to the southward should not prevent the genial breezes from playing on those further north. Mr. Bryce has arranged his wards so that their windows shall look east and west, so as each day to get the morning sun on one side, and the afternoon sun on the other.

The main front of the infirmary is turned towards the important thoroughfare of Lauriston; and here, as a matter of course, the architect has introduced his most important façade. The style adopted is an adaptation of the old Scottish, the frontage in some of its features bearing a marked resemblance to that of Holyrood Palace. In the centre is an elevation fully 100 ft. long and three stories high, in addition to a half-sunk basement. The main feature in this block is the great tower, which projects slightly from the general line, and has its base pierced by the main entrance. The arched doorway is flanked by a window on each side, as also by a series of pilasters supporting an ornamental cornice. Over the cornice is a three-light window, surmounted by a triangular pediment, apparently intended to be filled in with sculpture. The next stage of the tower is occupied with two plain windows, and a panel for an inscription or sculptured design. Above this point the tower rises clear of the wall-head—a massive square structure, with round corbelled turrets at the corners. The upper stage of its front wall is pierced by a three-light window, with arched heads. Towards the top the tower walls are corbelled outwards, and finished off with a cornice, above which rises an octagonal spire, carrying a vane and weather-cock. On the wall-head in front is a panel for a clock-dial. At the east and west sides are ornamental chimney-stalks, which combine with the spire and pinnacled roofs of the turrets to form a group. The elevations on the east and west sides of the tower balance each other. The ground-floor windows are plain; those of the first floor are surmounted with projecting pediments; and those of the top story terminate above in gablets, which rise above the wall-head and diversify its outline. On a level with the upper windows a corbelled turret springs out at each end of the elevation. The roof is high-pitched, relieved with a row of small dormer windows, and finished above with an ornamental crest-rail. The central block presents towards the east and west a sky-line of stepped gables.

From the central building, which may be generally described as designed for administrative purposes, there runs out at each end a low range, showing to the front large four-light windows, and finished above with a stone balustrade and flat roof. These are corridors giving access to the pavilions, which go to complete the north frontage, and contain the wards of the surgical hospital. Of these pavilions there are four on the north side, which, being placed end-on to the corridors, run out at right angles to the extent of 110 ft. beyond the line of the central block, and present their outer ends as prominent features in the general façade. The two inner ranges, distant each about 28 ft. from the central building, form with its front three sides of a spacious square, which will be gravelled over, and will form the carriage approach to the main entrance. As seen from the front, the pavilions present two distinct elevations, one on each side of the central block. There is a stepped gable, flanked by two round towers, like those of Holyrood; then an open screen, consisting of a low balustrade and range of stone columns about 10 ft. high; then other two round towers, with stepped gables between. Next is the central elevation already described, and on the other side a series of round towers and stepped gables, with open screen as before. In the centre of the screen, on each side, a short flight of steps leads down to an airing-ground, being the space inclosed between two pavilions and the corridor at the back, by which they are connected. These spaces measure about 80 ft. in width, that being the distance maintained between the pavilions. At the south end of each is a low building, 30 ft. by 30 ft., projected forward from the corridor, and intended to be used as a class-room. The pavilions are two stories in height, besides half-sunk basements. In their north ends they present three-light windows with stone mullions. The side elevations are plainer in design, but relieved here and there with stepped gables, turrets, and chimney-stalks.

The main-front architectural features are reproduced in a less ornate form, and under various modifications, all through the design. The central block is occupied with a spacious entrance-hall and staircases, manager's room, stewards' accommodation, and a variety of other offices. On each side branch off the corridors, 12 ft. in width, which give access on the right to the female, and on the left to the male wards. Each pavilion, or block of wards, seems to be as nearly as possible an exact duplicate of every other. The ward, with a height of 15 ft. 6 in., occupies the entire width of the pavilion, 28 ft., and its entire length as well, with the exception of a portion next the corridor, which is appropriated for a kitchen, convalescent-ward, private ward, doctors' room, nurses' room, and bath-room. At the opposite end, the interior of the round towers gives space for other necessary offices. Each ward is thus complete in itself, and may be isolated from the rest of the hospital, without interfering with the efficient treatment of its inmates. The ward proper has a range of windows and a fireplace on each side. The beds are placed between the windows, at distances of 9 ft. from one another. In the four pavilions which run northward from the corridors, and two others, not formerly mentioned, which run south, there are in all 16 wards (not to speak of private wards), containing 260 beds; besides 3 reserved wards, with 48 beds, to be used when the ordinary wards require to be vacated, for cleansing or other purposes.

From the rear of the surgical-house a low range, in which space is found for a commodious operating-theatre, besides corridors and stairs, leads to the present Watson's Hospital-buildings, which are to be retained and turned to account as residences for officers and accommodation for various administrative departments. Access to the latter part of the establishment is provided in the shape of piazzas, with open galleries overhead. A portion of the intervening ground, measuring 140 ft. by 80 ft., is proposed to be laid out as a garden, and to be used, in connexion with the piazzas, for the recreation of patients. In its general arrangement, the medical hospital repeats the features of the surgical department.

The medical hospital contains fifteen wards (besides private wards), with 340 beds, and is also provided with four reserved wards, making up 100 beds, to be used in cases of emergency. It thus appears that, exclusive of reserved wards, the two hospitals contain between them accommodation for 600 patients.

In addition to this, there is the fever-house—a separate building, placed at some distance to the south-west of the surgical hospital. This block has round towers at both ends. The fever-house is designed to make up about 40 beds. Between the fever-hospital and Lauriston is the pathological house, containing a lecture-theatre of ample dimensions, and a chemistry-room. The mortuary, washing-house, laundry, work-

shops, &c., are situate still farther to the west, at a distance from the public thoroughfare.

At each end of the north or Lauriston front a gate and hedge will be placed. The spare ground to the south of the medical hospital, sloping down towards the Meadows, is proposed to be laid out as pleasure-grounds.

THE APPROACHING INTERNATIONAL EXHIBITION.

Fans.

It seems necessary to repeat that the special object of the Exhibition is to exhibit selected specimens, and not everything that a manufacturer can produce; and it will thus be distinguished from previous Exhibitions, in which allotments of space were made to manufacturers and others, who filled them as they thought fit. All objects must also be submitted for the inspection and approval of committees of selection. The exhibitions will be distributed into four divisions, three of which,—fine arts, scientific invention, and horticulture,—will recur each year. In the other division different classes of manufactures will be included in turn each year, till every branch of industry has been represented. In the fine art and scientific invention divisions, no object will be entitled to admission unless it be distinguished by some special quality, such as novelty, excellence, or cheapness.

In the several classes of manufacture the goods will be distributed into a sufficient number of sub-divisions to bring the different branches of each class together, so that similar productions from different countries and localities will be placed in immediate juxtaposition, in order to facilitate examination and comparison.

We are asked to mention that artists, manufacturers, and others who have not expressed their desire to be admitted as exhibitors in 1871, are requested to do so before the 10th of November next.

The *Fan Competition* is exciting some interest. Her Majesty the Queen offers a prize of 40*l.* (1,000 francs) for the best fan exhibited in the International Exhibition of 1871, being either a work of painting or carving, or a combination of both, and executed by a female artist or artists under twenty-five years of age, subject to the conditions mentioned below. Mrs. Herbert Taylor offers a prize of 25*l.* for the second best fan. The Lady Cornelia Guest and the Baroness Meyer de Rothschild offer separately a prize of 10*l.* for each of the two fans next in the order of merit. All these are to be awarded subject to the same conditions as those decided on by her Majesty for the first prize. The conditions of competition are obtainable. The awards will be made by an international jury selected by the commissioners of the competing countries. The commissioners, as already notified, do not intend to award prizes to exhibitors. They will, however, afford every facility to societies and individuals desirous of offering prizes for the encouragement of art or industry in connexion with the annual international exhibitions; and are prepared to receive such offers, and to publish the conditions of competition which the donors may wish to prescribe.

In connexion with the Fan competition, we may mention that the September part of the *Journal of the British Archæological Association* contains a very interesting article on "Fans,—their Antiquity and Uses," by Mr. Henry F. Holt. The writer refers to the use made of the fan in the eighteenth century in recording the event of the day. Literature, music, politics, and fashion were alike made subservient to its power, and to an extent which can now be hardly imagined. In like manner church or opera, senate or theatre, became the medium of its exhibition. Thus, when Dean Swift's "Gulliver's Travels" appeared, all the principal events were depicted on both sides of the fan. The same result followed the production of the "Beggars' Opera," the favourite songs in which were painted on the fans, and political emblems were so rife that a lady's opinion was as readily known by her fan as by her patches. A similar practice prevailed in France, and in the time of the Revolution their artists were fond of recording the principal events of the period upon fans, among which may be mentioned "The Mountain Child of the Republican Constitution," "The Triumph of National Religion over Atheism, Fanaticism, and Scepticism," "The Fête of Agriculture," &c. Occasionally (although very rarely) "fans" were adapted in their ornamentation to the useful. At the close of the eighteenth century a fan was advertised in the *World* especially adapted to the frequenters of the opera, and was thus described:—"These fans present at one view the number of boxes, including the additional ones; the names of subscribers, &c., and have been carefully compared with the plan of the house, as kept at the office."

In the eighteenth century fan-making was an extensive and important business, and called into requisition the talents of the highest and best painters, many of whom commenced life as fan-painters. In England at this period an Italian artist, named "Pozzi," painted fans from designs supplied by West, Reynolds, and Capriani, and which, according to Miss Burney, were painted on leather, thereby meaning "chicken's skin," which she described as being "more beautiful than could well be imagined." In like manner, France produced in the eighteenth century many artistic celebrities with whose names "fans" are intimately associated. Amongst them may be mentioned Watteau, Godefroy, Frangenard, Boucher, Lelu, and Wille fils. Occasionally, says Mr. Holt, the fan was made to perform the office of "prompter," as occurred on the occasion of the market-women of Paris, offering a congratulatory address to Marie Antoinette on the birth of the Dauphin, when the spokeswoman had the address (written expressly for the occasion by M. de la Harpe) set down on the inside of her fan, and to which she repeatedly referred without the least embarrassment.

ON THE UNION BETWEEN SCIENCE AND LABOUR.

Dr. Lyon Playfair, president for the year of the Birmingham and Midland Institute, delivered an address at the opening of the session, "On the Intimate Union between Science and Labour." This union, he said, is far from being simple. It is not science which creates labour, or the industries flowing from it. On the contrary, science is the progeny of the industrial arts on the one side, and on the other of the experiences and perceptions which gradually attach themselves to these arts. So that the evolution of science from the arts is the first circumstance of human progress, which, however, quickly receives development and impulse from the science thus evolved. Industrial labour, then, is one of the parents, and science is the child; but, as often happens in the world, the son becomes richer than the father, and raises his position. It may not be the waste of an hour if we consider these relations more closely.

The new president then proceeded, in a very able address, to work out his theme with many illustrations. We can only give a specimen of his method:—I see opposite my study-window as I write a house in course of erection, and the labour of the builder will serve my purpose as well as any other. An Irish hodman is carrying a number of bricks up a ladder, in order to supply material to the builder. The sight is familiar to us still, though not so much so as it was a few years since, because a change is passing over this form of labour. Let us study the reasons for the change. The Irish hodman is a human machine, unskilfully and expensively put into operation. He felt that himself, in his fine, confused way, when he wrote to his friend in Ireland, 'Dear Pat, come over here and earn your money; there is nothing for you to do but to carry the bricks up a ladder, for there is a man at the top who takes them from you and does all the work!' The man at the top is a skilled workman, more nearly fulfilling his human functions, for he is using intellect in his work. The hodman is a worker also, but only a user of his own brute force in a very unintelligent way. Every time that he ascends the ladder with his load of bricks, he is carrying up his own weight in addition to that of the bricks; his force is thus wastefully expended. After many years his employer perceives this, and substitutes human labour first by that of a horse, then by that of a steam-engine. Now, when you pass a house in course of erection, you will see a horse trotting over a prescribed course. It is pulling up a whole barrowful of bricks by a rope and a pulley. The horse, tended by one man, is doing the work of seven or eight hodmen, and with much economy of money, inasmuch as the cost of the hay and oats, from which its power is derived, scarcely exceeds that of the beef, potatoes, and beer of a single hodman; while increased economy of labour is also attained, because the weight represented by the bodies of seven hodmen is not drawn up along with the bricks. Food, burned within the bodies of the men and the horse, is in both cases the source of power. Again, in large houses the horse disappears, and a small steam-engine draws up the bricks. Economy is again achieved; for the coal, which is the food of the engine, is less costly than the hay and oats required for evolution of force in the horse. A single man, using scientific knowledge in the guidance of the engine, is now doing the work of several horses or many men. Let us analyse the changes which pass over the forms of labour illustrated in this particular case. The first tendency is to substitute the brute force of a man by an intellectual superintendence of a cheaper form of force, either animal or physical, the aim being to obtain economy of production, either through economy of time, or by the substitution of a cheaper form of force for human labour. In fact, economy of time generally follows the economical substitution of force. Savages have an utter disregard of time in the performance of labour. They will expend a month in sharpening a single arrow. Some of the rock crystal cylinders worn by chiefs for ornaments are stated to take two men's lives to perforate. The Kamtschatdals of North-Eastern Asia take three years to hollow out a canoe, and one year to scoop out the trough in which they cook food. As soon as a savage tribe employs fire, instead of implements made of stone or bone, to hollow out their canoes, they are using a natural power to economise time and brute human force, and are on the high road to civilisation. In human progress it is always so, for it is a natural law that the sweat of the brow should be lessened by the conception of the brain. The economy produced by the substitution of cheaper for dearer forms of force is remarkable in all cases where it is applied. The Prussians saw this very well when they wanted to make England declare coal as contraband of war in the present campaign, that it was representative of so many men added to the enemy; for three or four pounds of coal, even in the wasteful way in which it is used, are more than equal to a man's force.

SCHOOLS OF ART AND OF SCIENCE.

The Dorchester School of Art.—The annual meeting and distribution of prizes in connexion with this institution, which was established about two years ago, have taken place at the Town-hall. Prior to the commencement of the proceedings, the friends of the school inspected the specimens of work executed by the pupils. Above the platform were ranged a number of drawings in chalk and water-colours, while around the hall were numerous specimens of freehand and modelling. The chair was taken by Mr. John Floyer, M.P. The Rev. B. L. Watson, as hon. secretary of the school, presented the annual report, which spoke of the continued prosperity of the school. During the year 1869 it was attended by 88 students, of whom 74 remained on the books at Christmas. At the Government examination on the 10th and 11th of March, in this year, 17 students presented themselves for examination in freehand, of whom 8 passed; in geometry, 8, and 5 passed; in model drawing, 17, and 10 passed; and in perspective, 6, and 2 passed. In freehand, 3 passed "excellently," gaining prizes; in geometry, 3; and in model drawing, 5. Eleven prizes were consequently awarded to nine students for excellence in examination. In April, 253 works, by 52 students, were sent up to South Kensington for examination. Of these 3, Miss Emson, Miss Maskew, and Mr. Edward R. Pearce, were deemed worthy of being admitted to the national competition, and five third-grade prizes were awarded. Payments were made on account of works executed by seven artizan students. The Science and Art Department having offered prizes for the best designs for fans, three of the students competed; and, though no prize was gained, the design by Miss Coombs was purchased for its excellence by the Department. Income of school for 1869, 195*l.* 6*s.* 5*d.*; expenditure, 176*l.* 6*s.* 1*d.* The magistrates of the county continue the gratuitous use of the Shire-hall. The necessity, however, of securing as soon as possible a more permanent home is not to be lost sight of. The committee desire to recognise the efficient services of Mr. Campbell, the master.

The Liverpool School of Science.—The tenth session of this school was opened in the small concert-room at St. George's Hall, and Professor Huxley, LL.D., F.R.S., distributed the prizes which had been gained by the students during the past session. Professor Huxley said he understood that the school was established in 1861. In 1865-6 the number of students amounted to not more than twenty-eight, and out of that number not more than thirteen presented themselves for examination, of whom only seven passed. But that might be considered their lowest point—their point of difficulty. He heard, and one could not be surprised at it, that with those results there was some talk of giving up the great enterprise in which those who started the institution had embarked; but, happily, wiser and more tenacious counsels prevailed, and now they saw a very considerable improvement in the affairs of the school. He was informed that now they had 151 students, and out of that number forty-one had presented themselves for examination; and although he did not know the exact number of those who had passed, it was certain that the number must be considerable, for no fewer than sixty-three names were passed in the different groups of examination either in the first or second class. Therefore the progress of the last five years must be considered eminently satisfactory; but, looked at from the point of view of any one who thought what ought to be the history of an institution of the kind in Liverpool, he could not quite so heartily congratulate them. He was informed that this school of science had not even at the present time any precise local habitation; that it had no laboratory, no place in which experiments could be performed, and in which practical teaching could take place. He was told, that in the way of positive endowments they were enriched to the singular extent of 17*l.* 13*s.* 6*d.*; and he had learnt that their income from other sources, leaving aside for the moment the school fees, which were turned to the purpose of giving the very modest reward which was given for the labours of the teachers, did not amount to 100*l.* In conclusion the professor urged the people of Liverpool not to slacken that grand public spirit which had done so much in diminishing the physical evils of their great town; to remove those obstacles which clog the path of mute Miltons and silent Hampdens; to give them a helping hand, and to aid them, as far as possible, to grasp that helping hand. The Earl of Derby said, for nearly the whole of the nine years that the Liverpool School of Science had been in existence he had been one of the vice-presidents, yet he had only been present at one distribution of prizes; but it was never too late to mend, and he should be happy to place 200*l.* in the hands of the treasurer, the proceeds to be laid out in a yearly prize, or in prizes, to be adjudged as the committee pleased.

The Brighton and Sussex School of Art.—The eleventh annual meeting of this school has been held at the Town-hall, Brighton. The mayor presided, and opened the proceedings with a brief address. Mr. F. Merrifield next read the annual report, and the certificates and prizes, which the mayor distributed. The meeting, which was select, though not large, was addressed by the borough members. Mr. J. White, M.P., alluded specially to some of the ways in which the rules of true art are violated; Professor Fawcett, M.P., regarded art more in its political relations. The Rev. Dr. Griffith urged ably the necessity of specific schools for different technical subjects. Mr. F. Merrifield described the working of the Brighton School of Art; and Mr. C. Lamb, in a characteristic speech, castigated the townspeople for not contributing more liberally towards the school, and set a good example by promising a contribution. The report stated that during the year 1869, 527 persons had received instruction at schools under the direction of the master, Mr. White, of which number 430 had been taught at national and other similar public schools, 25 at the day classes of the School of Art, and 57 at the evening classes for artizans, schoolmasters, &c. There were also 15 female students. A good many trades were represented in the School of Art. The second annual examination took place in March last, when, in freehand drawing, 10 were excellent, and 48 passed, against 8 and 43 respectively in the previous year; in geometry, the numbers were 10 and 8, against 3 and 6; in perspective, 2 and 5, against 1 and 3; in model drawing, 4 and 18, against 1 and 8; in mechanical drawing, none went up in 1869, one did so in 1868 and passed. The total number of prizes received from last year's work was 20, against 11 the previous year, and 4 certificates against 1 on the former occasion; there had therefore been a total increase of 50 per cent. With a larger subscription list the committee could greatly develope the utility of the school, as well as allow the head-master a better remuneration than the inadequate one he now receives.

The Government Commission on Applied Science. At the recent meeting of the British Association, Professor Williamson, F.R.S., made a communication respecting the resolution of the Committee of Section B, on the proposed establishment of a new school of applied science by Government. He said that the Commission appointed by the Government to make inquiries respecting scientific education had now been for some time prosecuting its inquiries, but it was credibly reported that they intend to take a course of action in this matter precisely of the kind objected to—establishing a special college for the purpose of training engineers for the Indian Department of the Government service. He said that there were at present universities in Great Britain which did this, and that if the Government carried out their intention they would not be in a position to deal impartially with the general question undertaken by the Commission. Besides, if it could be shown that such a college would be advantageous, let it be established after the whole subject had been dealt with. The section the previous day had passed a resolution in accordance with this opinion. The president considered that the committee of the section were quite justified in the resolution which they had adopted. After the Government had undertaken to make the inquiry, they had no right to establish such an institution until the Commission has reported.

SANATORIUM FOR DURHAM SCHOOL.

The Dean and Chapter of Durham, who have always shown a great interest in the well-being of their cathedral school, have recently erected a convenient sanatorium for its use, in place of the small sick-rooms connected with the master's houses.

The new building, which is separated by the playground from the school, occupies a most delightful situation on rising ground, having a southern aspect, and commanding beautiful views of the cathedral and the wooded banks of the river, with an extensive panorama beyond.

It is mainly constructed of brick, faced with Jowlan blockers and Dunhown dressings, is designed in an early type of Gothic in harmony with the adjoining school, and consists of a large central hall with four large rooms or wards for boys, rooms for parents or friends, but which can also be used for boys if required, matron's and servants' rooms, bath-room, kitchen, and offices, disinfecting and work room. The main building is two stories in height, with cellars under the whole of the east side, and the hall extends from front to back on both floors. The whole of the upper floors are constructed with Dennett's fire-proof flooring, and all rooms are ventilated by Doulton's air-flues. The cost of the work (exclusive of the site and furniture, which have also been given by the Chapter), is upwards of 2,300*l.*; and the whole has been carried out from the designs and under the superintendence of the cathedral architect, Mr. C. Hodgson Fowler, by the undermentioned tradesmen:—mason, Mr. J. Taylor; joiner, Mr. George Gradin; slater, Mr. R. Rule; smith, Mr. J. Chisman; plumber, Mr. Laidler; and painter and glazier, Mr. W. Hodgson.

THE NEW SEWERAGE SCHEME FOR DUBLIN.

It has at last been finally agreed upon that the Dublin Corporation shall accept 350,000*l.* at five per cent.,—four per cent. to represent the interest, with one per cent. as a sinking-fund, to exhaust the principal in a number of years. This sum will be advanced by the Government on security of the rates.

The plan of a parallel sewerage (confined to the city) each side of the river, which we suggested in these pages, is that adopted in the new scheme, but its efficiency depends much on the completeness of the outfall. Carrying the sewage to a point below the tideway, and emptying it into the sea in an untouched and unutilised state, would be a mad and mischievous act.

The stench in the Liffey, for three miles of its length, from King's Bridge to the North Wall Lighthouse, will certainly in a manner be abated, as the small sewers will be intercepted from passing into the river. This, so far, will be a great relief. We, however, can hardly credit as a fact that the whole of the valuable sewage of such an important city as Dublin will be wastefully cast into the sea, at a point where the greater portion of it is certain to be carried back again into the river-bed, to entail more laborious dredging operations than are at present needed to render the harbour navigable.

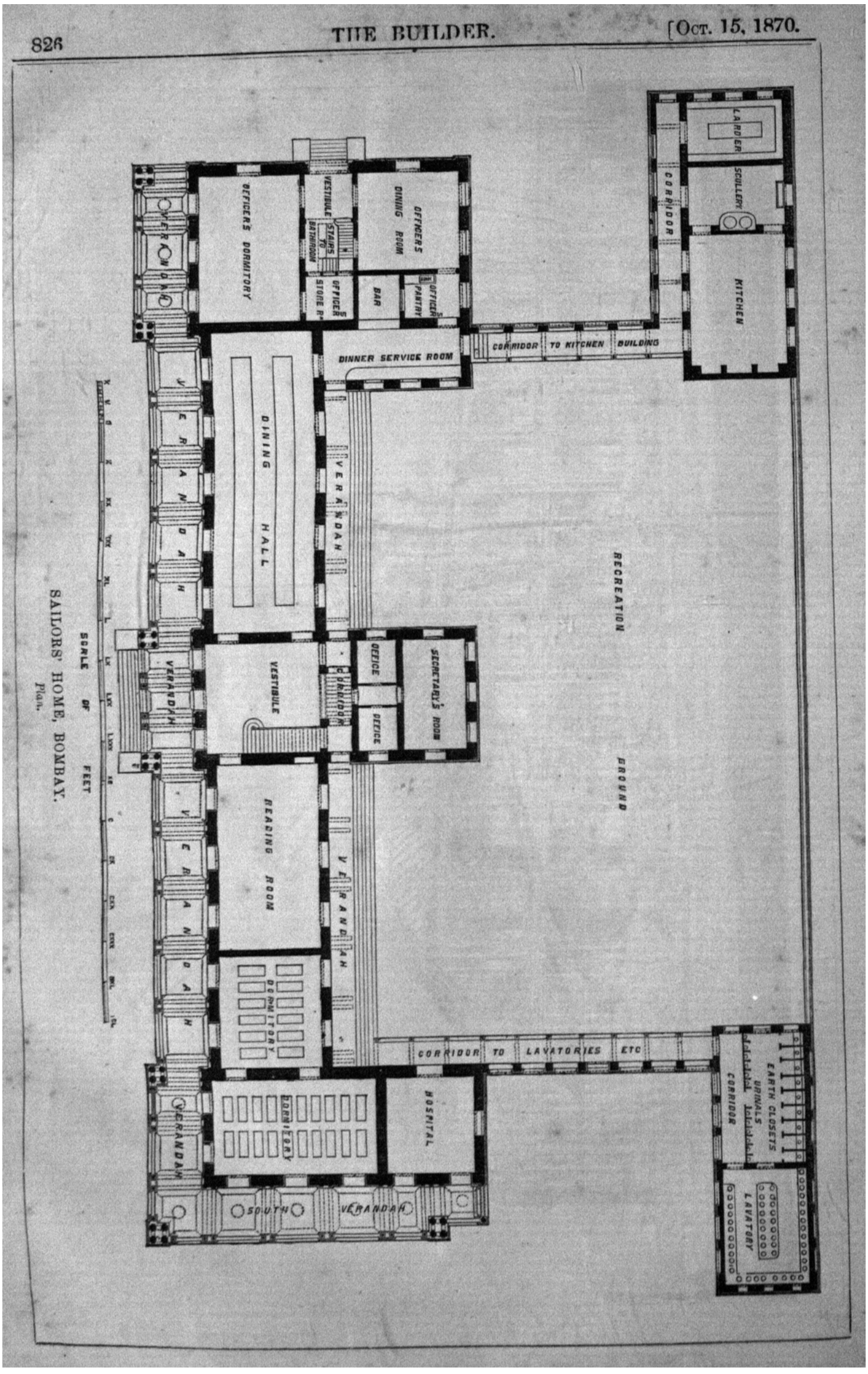
What about the unreclaimed strands of Irishtown and Clontarf. Can no scheme be adopted whereby some hundreds of acres of useless sandbanks, less than three miles from the city and in sight of the harbour, can be rendered profitable. The sewage of Dublin could be well utilised in this direction. We would caution the corporation not to throw away a convertible material that will help them to pay off their mortgages and lighten the city rates. A tidal river is the windpipe of a city; if this tidal windpipe is a short and narrow one, like the Liffey (and unlike the Thames and Clyde), its mouth is very likely to be blocked up beyond the measure of its own natural relief or swallow. The open sea, properly speaking, does not commence until the bar is crossed at Poobeg Lighthouse. Inside this a sort of inner bay or harbour exists. If the sewage is dispersed at any point within these limits, then we unhesitatingly say that the new sewerage scheme of Dublin will prove a delusion.

SAILORS' HOME, BOMBAY.

On the occasion of the recent visit of the Duke of Edinburgh to Bombay, it was determined to commemorate the event by the erection of some permanent work of public utility; and the happy idea was suggested that nothing would so appropriately celebrate the visit of the Sailor Prince as the foundation of a new Sailors' Home, plans of which had already been prepared, the existing building having been found entirely inadequate to meet the constantly increasing requirements of the port. The foundation-stone was accordingly laid by his Royal Highness, in the presence of Sir Seymour Fitzgerald, the Governor of Bombay, and a large concourse of natives and foreigners of distinction. Eager to signify their appreciation of so auspicious an event as the visit of a royal prince of England, some of the native princes subscribed largely to the funds; the Guicowar of Baroda alone contributing the munificent sum of 20,000*l.* In consequence, however, of some misunderstanding in regard to the site, the building has not yet, we believe, been proceeded with.

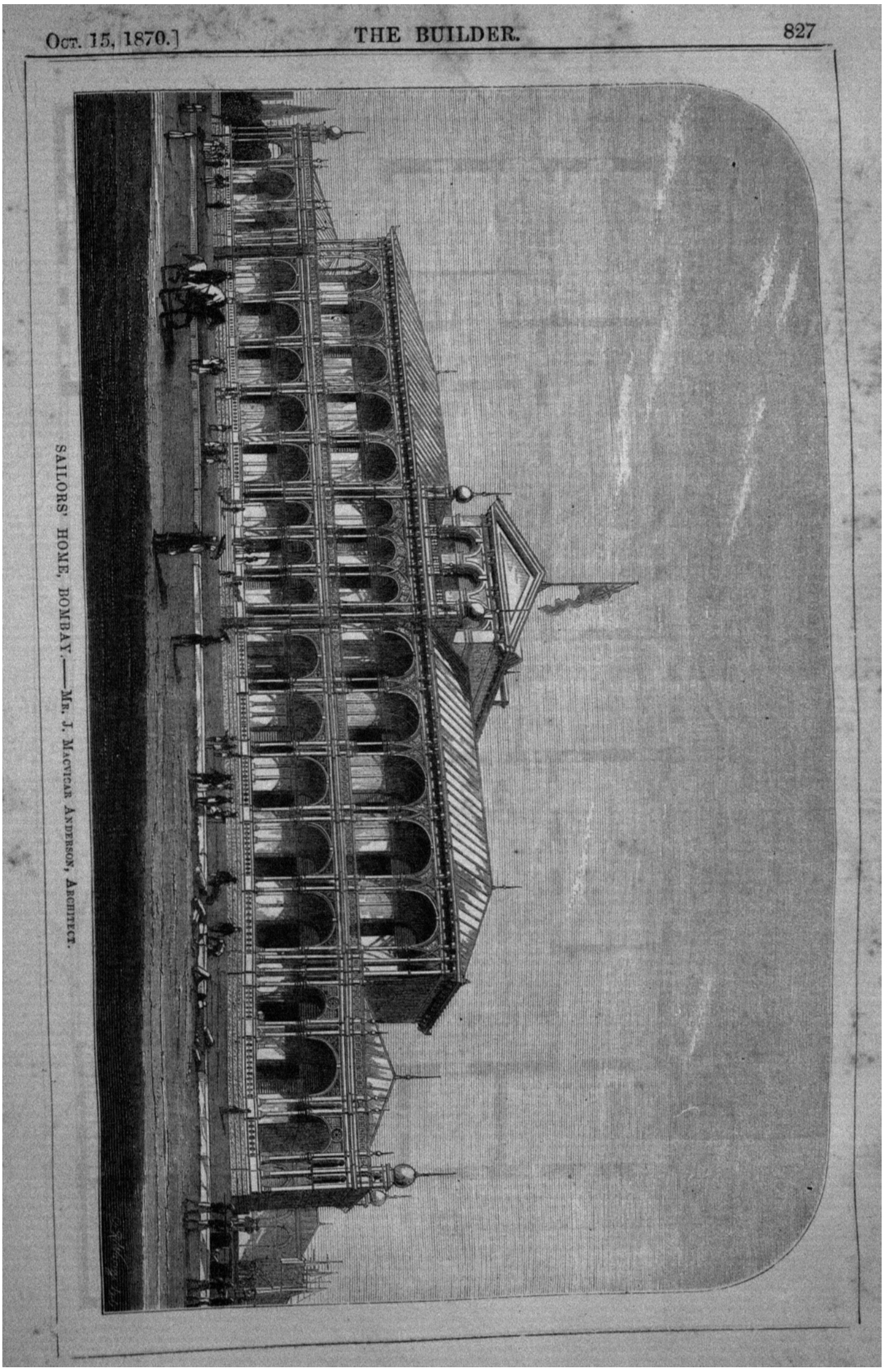
We give a general view of the proposed new Home, with a plan of the ground floor, as designed for the site originally given by Government, on the Colaba-road, which possessed a frontage towards the sea of 300 ft., with a western aspect. The central block and south wing comprise complete accommodation for 126 seamen; the north wing is devoted entirely to officers' quarters; and the Home master's residence is placed in the attic story, in the centre of the building. The kitchen department is placed in the north-east; and the lavatories and earth-closets for seamen in the south-east angle of the site, communicating respectively with the main building by means of covered corridors. Wide verandahs encircle the whole edifice to the west and south, and smaller ones at the back. These it is proposed to construct entirely of iron, which would be made in this country and sent to Bombay ready to fix. The floors throughout are to be constructed with rolled iron joists and cement concrete. The windows are, in all cases, to have double casements, the one glazed, and the other "Venetian." The roofs are designed to be constructed throughout of iron, covered with Italian zinc, laid on solid boarding; and special precautions have been taken to secure thorough ventilation, and to provide against discomfort (particularly in the dormitories, which occupy the whole of the upper story) from the great heat of the climate. It should be stated that the plans have been so arranged that, by the addition of either one or two stories to the north and south wings, the amount of accommodation might easily be doubled.

Estimates for the ironwork have been obtained from Messrs. Andrew Handyside & Co., of Derby; and the whole has been designed by Mr. J. Macvicar Anderson, of London, architect.



SAILORS' HOME, BOMBAY.

Plan.



SAILORS' HOME, BOMBAY.—Mr. J. Macvicar Anderson, Architect.

SASHES AND SASH-HANGINGS.

Sir,—The discussion that has already taken place in your columns is of so interesting a nature, that I beg you to allow me to say a few words on the subject of sashes generally.

The question appears to me to be under three heads:—

1st. What kind of sashes shall be used.

2nd. How they shall be hung.

3rd. What they shall be hung with, and other such details.

The first question is conclusively answered by your note to the letter of "M. H." (Sept. 17). Climate is the great regulator of such matters, and ours, a mixture of about eight parts of bad to four parts of good, forbids the general use of French casements, which practically have no medium between being either quite open or quite closed. The second question is also almost settled by the same consideration. The idea of balancing the sashes by each other's weight is by no means new, though constantly reappearing. Your correspondent, "A Working Man," has discovered it for himself. "The Experienced Mouse" has used it long ago, and Marygold's patent rack slips are essentially on the same plan. In all these the abolition of the weights is gained by the loss of independent action, and this is attended by a total loss of comfort in winter time. The other idea of using springs instead of weights is unpractical, and fitted only for models, as a few figures will show. Suppose a top sash to weigh 30 lb., the springs must be sufficiently strong to produce a friction rather greater than this, say 35 lb., and a pull of 5 lb. will then suffice to draw down the sash. But, on raising the sash, it is necessary to apply a force equal to the weight of the sash *plus* the friction caused by the springs (for these act equally in going up and coming down), requiring therefore a push of 65 lb. The various contrivances spoken of by the "Mouse,"—the facings of leather, cork, &c., are all of this class, and subject to the same defect independently of workmanship, which, if bad, may add indefinitely to the power required.

Mr. Bullivant's sash, so curiously supposed by "A Working Man" in his last letter to be the ideal of "G. L.," is a very ingenious modification of the double-hung sash, and much facilitates cleaning, &c.; but since this is accomplished by temporarily detaching the weights from the frames, a great inconvenience results in its application to heavy plate-glass windows.

The balance of advantages being so strongly in favour of the ordinary double-hung sash, the third point is with what to hang them. The choice lies, so far as I know, between common and special sash-line, copper chain, copper-wire cord, catgut, leather cord, and Sawyer's rack slips. These last are a modification of Marygold's slips, in which the weights are retained. Toothed slips are fitted to each side of the sash, and gear by small pinions into corresponding racks on the weights, a very unnecessary amount of trouble and cost, merely to avoid using sash-lines. Of the others named, leather cord is somewhat weak for its size, as compared with best sash-line; catgut gives way soon, copper-wire cord even sooner; copper chain is very good, if carefully soaked in oil, to ensure all the joint-pins being oiled. I have known a large chain cut through in three months, owing to a "dry" pin. Its disadvantage is that when the sash, at any subsequent time, is taken out of its frame, the chains often get badly wrenched sideways, by carelessness, and are then permanently injured. On the whole, I prefer the best flax-thread sash-line (ordinary jute-mixed fluffy sash-line is mere rubbish), and would recommend it to be well served with tallow, or some such preservative before use.

The system of hanging sashes to conceal the "frightful ropes" so mysteriously learnt by "the mouse" has one great defect. He says, under this plan "the weights will go down much further than usual,"—apparently an advantage; it should read, "Will require to go down much further;" in other words, the side-frames of the sash must be carried down below the sill, to—say, the floor-line, involving considerable extra cost, and spoiling the building up of the frame.

Is the double-hung sash, then, perfect? By no means. Much has been done, by avoiding painted sash-frames (in best houses), to allow the sashes to run freely, as it can scarcely be expected that a sash, originally properly fitted to a groove, will work comfortably after that groove has been reduced by the thickness of three coats of paint now and then. But a sash that shall be permanently free running, thoroughly watertight, and easily removed and replaced by ordinary servants, for cleaning, &c., has not yet been brought out. I do not speak of metal sashes, as their great cost is simply prohibitory.

The best thing to do is to provide a ready means of working the present sashes; but these, sir, are not advertising columns, so I will say no more on that point, remaining, W. M.

In addition to the material for hanging sashes mentioned by "W. M.," we take the opportunity of mentioning Mr. Hookham's Patent *Steel Ribbon Sashline*. This is formed of a double band of watch-spring steel covered with a close binding of copper wire, and protected inside this binding with a water-proofing preparation. It claims to be superior to the lines now in use in every respect. Hemp lines become harsh through the action of the atmosphere, and are always breaking. Wire lines are unadapted for running over small pulleys; and chains are, if well made, too expensive for the purpose. It is claimed for the steel ribbon sash-line that it is not liable to be affected in the same way as the hemp line. Secondly, the thin bands of tempered steel bend over the pulley and become straight again without injury; at the same time that their breaking strain is astonishingly high. Thirdly, sashes hung with this line run with great freedom. It seems to deserve a trial.

THE ROYAL ARCHÆOLOGICAL ASSOCIATION OF IRELAND.

This Association—late the Kilkenny Archæological Society—held its October meeting on Wednesday, the 5th. New members were elected.

The secretary called attention to the appeal of Sir William Wilde through the press for subscriptions to form a fund to prevent further desecration at Roscommon Abbey, and repair that interesting ruin and the O'Connor Tomb; as also to the movement of the Rev. R. Richey, Ardmore, to rebuild, by subscription, the conical portion of the summit of Ardmore Tower—at present in a very perilous state,—using the original stone for the purpose. Both were most heartily approved of by the meeting, as the restorations proposed were in safe hands with the two gentlemen named.

Mr. Robertson, Hon. Curator of the Museum, reported the safe arrival of a quantity of curious pieces of ancient timber, oak, and deal, which had formed a framed structure in the Crannoge in Ballydoolagh Lough, and was presented by the Earl of Enniskillen.

Mr. Watters, Town Clerk, Kilkenny, exhibited some ancient documents from the Municipal Archives at present in his keeping, which seemed to excite a good deal of interest amongst the members.

THE PRINTERS' ALMSHOUSES, WOODGREEN.

On Saturday afternoon, a large number of the subscribers and friends of this institution assembled at Woodgreen, to witness the ceremony of laying the foundation-stones of two new wings to the almshouses; that of the south, or commemoration wing, being laid by Mrs. Figgins, widow of the late treasurer; and that of the north, or "Maries" wing, so called after the wife and daughter of Mr. J. Wright, of Kingston-upon-Thames, who bequeathed a sum of 2,000*l.* to the institution for the purpose, by Earl Stanhope.

The architecture of the wings will be Tudor Gothic, and the estimated cost is 3,334*l.*, all of which has been obtained; but donations are earnestly requested, in order to endow the new buildings. The north wing will contain residences for the accommodation of ten married couples, and the south for six widows. There will be thus sixteen additional residences; and although there will be ten on the north side, and only six on the south, the wings will be of the same length, inasmuch as the former will have rooms back and front, and the latter will have them all in front. The architect is Mr. Charles Bell, Strand; and the builder is Mr. W. Henshaw, of City-road. The buildings are expected to be completed for habitation early in February next.

The Printers' Almshouses, which sprang from the Printers' Pension Society, was instituted in 1841. After eight years' successful operations, sufficient funds were accumulated to erect a residence capable of affording an asylum for twelve aged and infirm printers. The foundation of this, the original building, was laid on the 11th of June, 1849, by the present Earl Stanhope, then Viscount Mahon. Owing to many adverse circumstances, the building then commenced was not completed for several years. On the 11th of June, 1856, the elected inmates took possession of their respective apartments for the first time. Since then there has been a regular succession of inmates, and the only drawbacks to the benevolent operations of the institution have been want of house accommodation and want of funds. The inmates are provided with every domestic comfort that they could reasonably expect. As a certain subscription to the funds of the institution is a condition of admission, the inmates may be said to be reaping the benefit of their own provident habits in early years.

ST. PAUL'S CATHEDRAL.

Sir,—In an article in last week's *Builder*, on "British Museum Restorations," it is said that the restorations of St. Paul's Cathedral consist of painting it with several coats of oil-colour.*

This remark seems calculated to convey a wrong impression of the intention of the Dean and Chapter, and the Committee.

A good deal of old oil-colour has of late years been removed, and none put on, except as a necessary ground for gilding. The intended decorations will assuredly not be in oil-colour, whatever other method may be adopted; and it is the desire of the Committee to use principally mosaic and marble.

The restoration of Sir James Thornhill's work in the dome, which was done nearly twenty years ago, may indeed have given some colour to the remark; but the dull effect of this painting has had a powerful influence in suggesting the use of mosaic in what is intended, and indeed commenced. Even the restoration of the paintings in the dome referred to was not, strictly speaking, in oil-colour, but with the use of a so-called encaustic vehicle, in which wax is an important ingredient. F. C. Penrose.

A PROTEST.

David, the King, refused to offer unto the Lord his God of that which cost him nothing.

The generous old Hebrew sentiment is still alive with us Christians, even in *this* age of vanity, falsity, and outside show, as proved by many a noble instance of heroic endurance and steadfast self-spending; but, alas! the reverse is also to be found among us.

When I read in the *Times* of October 3rd, that, possibly with some strangely-perverted notion of acting charitably and benevolently, some persons had sent to the Society for Aiding the Sick and Wounded, many bales of filthy, greasy rags, that were obliged to be burned as quickly as possible, for fear of infection being produced by them, I said, "There must be some mistake here. No English women, let alone English ladies, *could* have done this: these rags must be the clearings out of some factory, where they have been used for wiping grease off machinery. If any decent woman *had* such things in her house, she would never let them be packed up and sent in that state."

Yesterday, I am sorry to say, my high estimate of what English women can or cannot do was somewhat shaken. I went to see the works of art in Bond-street that have been gratuitously presented for the relief of German widows and orphans during the present war. Of the bad taste of English neutrals making any distinction between French and German sufferers, when *relief* is the subject under consideration, I need not speak, that matter having been already commented upon in the *Builder's* pages; but in no paper have I seen any honest criticism on the works exhibited; and therefore it is that I trouble you with these few lines.

With the exception of the pictures of our talented Princesses; Carl Haag's beautifully truthful old head; P. Leviu's touching little bit, "Unterstützung für Wittwen und Waisen;" A. M. Caswell's "Bullslaughter Bay;" Couldery's "Harold;" Hoyoll's "Ferdinand Freiligrath;" Dighton's "Lodge Gate at Aldermaston;" Volck's "Von Moltke;" Miss Farmer's "Sketch;" Helander's genre picture; Helen Miles's "Design

* Not exactly.—Ed.

for Decorative Painting" (though wanting in correct drawing in parts); Von Schmidt's "King of Prussia;" Chase's interior of "Dunkeld Cathedral;" and a very few others, all the works are of the most ordinary kind.

From these, a second exception must be made of those that are of an extraordinary kind; that is to say, extraordinarily bad. What *can* be the use of either painting or exhibiting such rubbish as Nos. 57, 81, 146, 221, 224, 232, and 234? I know we are told "not to look a gift-horse in the mouth"; but in this case the "gift" is no "horse" at all, nor even a Jerusalem pony; nothing but a wretched make-believe. People must not be allowed to "lay the flattering unction to their soul" that by giving such trash as this they are doing an act of charity. The soiled and commonplace engravings and drawings in the large portfolio at the Exhibition, with a few very special exceptions, must also not escape without their meed of censure. If the sickening rags sent to St. Martin's-place were the sweepings of houses and factories, much of the *Art* (?) to be seen at the Bond-street collection is assuredly the clearing out of studios and portfolios.

To the misjudging donors of this trash I commend the study of the sentence with which I commenced this letter, and subscribe myself yours dejectedly,

ONE OF THE PUBLIC.

TAR PAVEMENTS.

IN reply to your correspondent, "S. M. F.," I send you a specification of the mode of laying tar pavement which I and many other surveyors have adopted, and found completely successful.

For Carriage-way.—A layer of good dry brick-rubbish, 8 in. thick, well rammed (if a gravel foundation this need not be used), Kentish rag stone, or the chippings from granite, are the best material.

For the tar pavement the stone for the lower bed should be broken to pass through a sieve of a 3-in. mesh, to be well coated with hot Stockholm tar, to be laid 6 in. thick, and well rolled. The next bed is to be broken to pass a 1½ in. mesh, to be laid 2½ in. thick, and well rolled. When nearly dry, broken gypsum to be scattered over it, and well rolled: this gives a bright look to the pavement.

For Footways.—Brick-rubbish, 5 in. thick; lower bed, 4 in. thick; next bed, 2 in. thick; and gypsum as before.

Your correspondent may see this pavement at the Royal Arsenal, Woolwich.

THE LAYER OF THIS PAVEMENT.

NEW BATHS AND RESERVOIRS, HARROGATE.

THE Harrogate Improvement Commissioners have determined to erect a large suite of baths and reservoirs upon the Victoria Baths estate, at an estimated cost of 10,500*l*. The plans have been prepared by Mr. J. Richardson, town surveyor, and the buildings will occupy the site of the gardens lying on the side of the Victoria Baths, and between Promenade-terrace and Cheltenham-square. That portion of the land which is not covered by the new buildings will be converted into pleasure grounds. The central portion of the building, on either side of the main entrance, will consist of waiting-rooms, one for ladies, the other for gentlemen, with separate entrances to each. The principal entrance leads to the manager's office, built upon the circular plan, so as to command a view of the whole interior of the establishment, including the entire length of the corridor, which is 8 ft. wide and 200 ft. long. Behind the office is the house of the manager. The bath-rooms are placed on each side of the corridor: those in the corridor to the right, or east of the entrance, are ladies' baths, and those to the left or west of the entrance are for gentlemen. The whole of these bath-rooms are 10 ft. by 11 ft. each. Attached to these bath-rooms on one side of the corridor is a dressing-room to each, and on the opposite side two dressing-rooms to each bath-room. Each dressing-room contains a water-closet; and in each wing provision is made for two shower and two vapour baths. At either end of the long corridor is a swimming-bath; that on the east or ladies' side being 47 ft. by 17 ft., with six water-closets and four dressing-rooms. At the opposite end, the gentlemen's swimming-bath is 68 ft. long by 17 ft. wide, with three water-closets and seven dressing-rooms. The walls and floors throughout are to be tiled, plaster being wholly excluded. The roof is an open one and boarded. The swimming-baths from top to floor are 28 ft., and the baths and dressing-rooms are 16 ft. in length.

FLAT ROOFS.

IN our number for the 13th of March, 1869, we spoke on the fireproof properties of asphalte, and particularly with reference to some experiments that were made by Sir Henry Ellis and others upon some asphalte that was laid by Claridge's Asphalte Company. The material from this same company is being employed by Messrs. Lucas, Brothers, to the extent of about 60,000 feet superficial at the Albert Hall of Arts and Sciences, and at the buildings for the International Exhibition, Horticultural Gardens, South Kensington. This shows good confidence in the application of such material to flat roofs. It promises to make a capital job.

THE HOLYHEAD BREAKWATER.

WITH reference to a notice in our last issue, the men at work on this undertaking are under the superintendence of Mr. Caldwell, for Messrs. Rigby & Co., of Westminster; not of Mr. Williams, who is the foreman of the works. We learn from Messrs. Rigby that the advance lately made is even greater than we stated, the masonry at head and the lighthouse are now 17 ft. above high-water spring tides.

LIVERPOOL ARCHITECTURAL SOCIETY.

THE first meeting of the present session of this society took place last week, at the Royal Institution. The chief business of the evening was the president's inangural address. In delivering this, Mr. H. H. Vale took a hasty view of the architectural and sanitary events in progress in Liverpool. Touching upon the high death-rate which distinguished the town in an unenviable sense, he observed that the system of sewerage adopted in Liverpool was one of the most costly, though the situation of the town was one of the most favourable for carrying out an efficient system of sewerage. The old Romans maintained that sanitary cleanliness was a continual improvement; but he regretted to say that our public thoroughfares were still left in the most filthy condition, notwithstanding all our boast of sanitary progress. He was glad to believe that Liverpool was gaining a higher character for her street architecture and public buildings. With reference to matters of art, he regretted the course taken by the Town Council in regard to the long-talked-of Gallery of Art. Speaking generally of the prospects of their profession, he believed that the latter half of the nineteenth century would see a great improvement in the adoption and practice of the purer styles of architecture than had prevailed for some centuries. He rejected the idea of a new and specially distinctive style in the present condition of architecture. We were more successful and more likely to excel in restorations of the best forms of former styles. As to the inception of a thoroughly original style, he considered the French or the American republicans as the only people likely to work out such a resolution. Reverting to the ecclesiastical architecture of this town, he remarked that he was not a believer in the immediate necessity of a Liverpool cathedral.

Mr. T. H. Wyatt, who was present, said, in allusion to the forthcoming international exhibition connected with architecture, that the correspondence between the Institute of Architects and the authorities of the Kensington Museum had resulted so unfavourably that the Institute had determined to have nothing to do with the arrangements. The storm might blow over, but that was the unfortunate state of affairs at present. On another point of the president's address he expressed an opinion that it would be for the benefit of the whole country if there was a uniform Building Act.

Mr. J. Boult, in moving a vote of thanks to the president for his address, said that with reference to the remarks on councils of conciliation and arbitration for the building trade, he could convey to the public a piece of information. About eighteen months ago a proposal was made by the masters in Liverpool to the operatives to establish such councils, the proceedings to be private and regarded as a private understanding between the masters and the men, and a fresh Board to be appointed in each case of dispute. That proposal was, unfortunately, rejected by the operatives. They did not at that time thoroughly understand the principle of arbitration, and they were afraid of being prejudiced. About three months ago, however, the men having, to use the phrase made famous by a late prime minister, been educated up to a certain point, made a proposal to the Master Builders' Association to establish courts of conciliation under the provisions of the Act of Parliament. That was met by a reminder from the masters of their former proposal, and to this the men rejoined that the court which would have been established under that proposal was to be private and without any recoguised legal authority. They said they would have more confidence in a court established under the provisions of an Act of Parliament, and with its proceedings open to the public. Since then the masters had again had the matter under consideration, and he regretted to state that they had just decided to reject the proposal of the operatives.

Mr. H. H. Statham, the hon. secretary, gave some interesting particulars, derived from an afternoon spent that day in Chester, of the present position of the restoration work at the cathedral, particularly mentioning the discovery and intended utilisation of a curious Norman relic adjoining the western entrance to the nave.

STAIRCASE HANDS.

A "Staircase and Handrail Hand" writes to defend his fellow Staircase Hands against what he fancies a slight thrown on them by previous correspondents. This, however, is quite unnecessary. The writer says, in the course of his letter, what many will be sorry to hear, and, we are afraid, is not to be denied,—

Perhaps I can tell your correspondent what may rather surprise him, viz., that the continued handrails made more than fifty years ago—take them generally—were better executed than a great many done now, for the very reason that they were made by men in good practice. In most of the former, the wreath is much more graceful than in the latter because they were done by men who had devoted their *whole time* to the business, and not by men who set themselves up as staircase hands but knew very little about it,—by this means many good jobs are now spoiled. I do not object to theory, but only say that without practice it is of little use. Why I write this is that we, who are only the poor artizans, should be dealt with fairly, and not held up to ridicule.

I will make one remark on Mr. Riddell's book; that is, that the mode he sets out for placing the "riser" of winders so as to make it better for the soffit-strings and handrails, has long been the practice of all good staircase hands, though I am aware they are seldom drawn so by the architect, but left to the practical man.

I beg to add that should his work enable a man who could not master the difficulties of the art by the aid of the older works, now to acquire it, I, for one, shall not be sorry. But still I cannot believe that an inferior intelligence and less ability will be required, and your correspondent of September 24th will still have to complain of a "monopoly;" the monopoly which superior skill, ability, and experience always have and always will hold.

A STAIRCASE AND HANDRAIL HAND.

Another correspondent says,—

That part of your article relating to plans of stairs it would be well for architects to read and digest. Staircase-hands are not generally consulted as to the plans of stairs they are required to execute: indeed, it would be considered highly presumptuous by the architect were they to suggest any alteration or improvement to his designs

You charge staircase-hands with being intolerant in requiring a bench. Staircase-hands do not profess to be better or worse than other people, and I think your article unnecessarily severe upon them. Concerning the work under notice, your own observation respecting the system of kerfing will also apply to placing the landing risers of stairs in the cylinder of the half-space and level landing description.

I have seen it done; I did them so myself years ago. You will even see it in the 3s. 6d. Book of Drawings for Carpenters and Joiners, lately issued. With regard to the general system of lines, any young man in the trade with average capacity, and who does not mind spending a little, if he cannot find out a better paying game to enhance his worldly interests, will do well to study this, and he will not regret the time devoted to its pages.

Your correspondent, "F. D.," complains of monopoly by staircase-hands. His reasoning I do not exactly see. Monopoly of what? Of doing that which he and others are not competent to do. If the sentence ran thus,—"And so ends an indifference which is a disgrace," &c., it would at least be intelligible. His remarks about St. Paul's and the scene-painter are equally absurd; as in either case the job would be simply spoilt,—a very good reason for not intrusting them with it. Whatever the privileges and exactions of staircase-hands of the olden times were, those of the present are not so fortunate, and I maintain that a thorough good man in this line who can execute his work on the newest methods, from drawings (and there are such men), without trouble to the manager or anxiety to the master, is deserving of more pecuniary reward than he at present receives, and which he has a perfect right to expect.

A. B.

A THREE-BRANCH HAND.

SIR,—Architecture is evidently looking upside down, and ye architects may soon go and hide your diminished heads.

Read the following reassuring piece of manful assurance which has just appeared in one of your daily contemporaries:—

"A GENTLEMAN, who has recently built a Country Residence, is desirous of RECOMMENDING to any one about to build, a clever FOREMAN, who has manfully carried out the duties both of Architect and Builder to the entire satisfaction of the advertiser."

After this, who, with a little money to throw away, would not build? No premiums, or percentages, or "architect's man" to act as a spy, or a "go-between." Nothing of the kind; but one who can "manfully" carry out *in globo* the triple duties of "active architect," "experienced builder," and "clever foreman." It cannot be that this gentleman, who has recently built a house in the country, is any relation to his architect and builder. Blood, we know, is thicker than water.

Three-branch hands of the lower strata are not often

above the want of a job, as your excellent pages often sadly show; but it is unaccountable to me how an architect, builder, and clever workman should need a recommendation, as well as a job.

I was a workman myself, and I think I thoroughly understand my trade. Whether I was clever or not I cannot say; I am content to know that I was always in constant employment, while the "Jacks-of-all-trades" in my neighbourhood were always lounging about public-house corners.

Manfully carrying out a job, I believe means boldly, courageously. Well, sir, I have known many a "botch" in my experience to be as courageous as a lion, ready to undertake anything, and, oh, Jupiter! what a Juggernaut of fallen *débris* and butchered materials have not mine eyes seen! With a vivid recollection of many building abortions, I am pleased to remember that I was only

A One-Branch Hand.

"LIFTING HOUSES."

Sir,—This process, as also "Moving them bodily," as you expressed it in a former number, is by no means confined to Chicago, but is a daily occurrence in every city of the United States. In New York you may constantly witness removals of all kinds; one day lifting a house up bodily, some 14 ft. or so, giving a temporary strange appearance, with the street door up in the air, as it were, while building a large store or ground-floor below, and up to it. There is no difficulty whatever in the matter. The writer has had considerable experience in New York in all this sort of thing, and would think no more of putting in an estimate and contract for a removal of any extent than he would for the most ordinary building transaction. He has seen a row of houses moved from one side of a street to the other, the same having to be turned wholly round in the process, and this in New York, where the soil is a treacherous compound of rocks and sand. As a constant subscriber, I enclose my card, and am, Sir,

Contractor.

CASES UNDER METROPOLITAN BUILDING ACT.

THE GROUND STORY.

At Hammersmith Police-court, Mr. Yates, jun., of Mary-street, Shepherd's-bush, appeared before Mr. Dayman, to answer an adjourned summons, at the instance of Mr. Knightley, the district surveyor of Hammersmith, for constructing chimneys upon corbels at the ceiling level of the basement.*

This case has been adjourned several times, and had created considerable interest in the profession, in consequence of the magistrate having expressed an opinion that the ground story of a house was that which was next to the footings. That was also the defendant's view of the question, which was the point he raised, but Mr. Knightley said it was commonly understood by the profession that the ground story was the same as the ground floor, which was on a line with the road. The case, however, stood over for further consideration, and in the mean time articles were published, and letters written by surveyors and architects, all pointing out that the opinion was wrong.

Mr. Dayman now said that he had not read any of the articles, in order that he might arrive at an opinion founded upon the construction of the Act of Parliament. Having read several sections, and pointed out to the defendant the interpretation to be put upon them, he said that he had arrived at the conclusion that a ground story was the ground floor. He then made an order as prayed, in effect to remove the present chimneys, or carry up a brick pier from the foundation.

The defendant at first intimated his intention of appealing, but afterwards consented to abide by the order.

SHEFFIELD.

The New Music-hall.—At a meeting of the directors of the Company for the Erection of a new Music-hall, an account of which we have already given, a letter was read from the Duke of Norfolk, offering a donation of 200*l.* towards the erection of an organ for the large hall. The meeting was then made special, to consider the best means of obtaining a grand instrument, equal to any organ in Yorkshire. The following makers were named as likely to be asked to send in specifications and tenders, viz.:—Cavaillie Coll & Co., Paris; Shultze, of Germany; Willis, of London; and Brindley, of Sheffield. The cost of the instrument is not to exceed 2,000*l.*, and a sub-committee was appointed to make inquiries. The share-list, we are informed, is increasing, thirty new shares having been allotted since the corner-stone was laid, on the 1st September, 1870. The building is in a forward state, and will, it is expected, be roofed in by January, 1871.

The Proposed Public Museum.—At a recent meeting of the town council, the Free Library Committee were instructed to report on the desirability of a public museum being established in and for the borough of Sheffield; and that committee unanimously decided to recommend the council to establish such a museum. As to the ways and means, they were of opinion that all the council would be called upon to do would be to purchase or erect a suitable building for the museum, to pay the salary of a curator, and the expenses incidental to keeping the museum in a proper condition. The foundation of the museum would be the collection belonging to the Literary and Philosophical Society. A suitable building, the committee thought, could not be obtained for much less than 5,000*l.* (which amount could be borrowed under the Libraries and Museums Act), the interest upon which would be between 160*l.* and 200*l.* a year. It was estimated that the annual cost of keeping up the museum, inclusive of interest upon the borrowed capital, would be about 500*l.*; and the committee, we understand, propose to raise this sum and also the amount required for the establishment of a branch library somewhere in the neighbourhood of Brightside and Attercliffe, by levying a penny library rate instead of a three-farthing rate, as is now the case. So largely had the rateable value of property in the town increased that it was thought the extra rate would produce somewhere about 2,500*l.*, and that allowing 700*l.* for the expenses of the two branch libraries—the one already existing at Upperthorpe, and the one to be established at Brightside—there would be a balance of about 500*l.* to be appropriated for the purposes of the museum.

* A report of the first hearing will be found at pp. 669 and 711, *ante*.

CELLAR TRAPS.

Sir,—Why publicans' cellar-trap-boards should be allowed to encroach across the pavement is a mystery. In some cities it is not permitted; in London, we are oft, to avoid barricades of tubs, barrels, stretched ropes, and rolling casks, forced to take to the road. The owners of these *traps* (tender-hearted "pubs.") stud them with gigantic conical hobnails. To torture tender-footed pedestrians is a crying wrong. Many of these rotten traps will not stand the dead weight of a live man; so perhaps it is as well to steer clear of them.

R. T.

LONDON BUILDERS' SOCIETY.

The following is a copy of an agreement lately come to by the members of the London Builders' Society:—

"The members agree that they will not tender for any works in competition, the quantities of which have not been taken out by a surveyor agreed on by the builders at a meeting of the competitors.

They further agree that they will not sign any legal contract for works obtained in competition that does not contain a full and fair arbitration clause.

It is also very important to point out the meaning and intention of clause 7 of the conditions of contract as agreed to by the Council of the Institute of Architects, which is that 'priced bills of quantities' are not to be demanded from builders, but variations from contracts are to be estimated according to an agreed schedule, or at fair measure and value.'

ACCIDENTS.

London.—Two accidents have occurred at the Hall of Arts and Sciences, now erecting at Kensington. The first was to a painter. The man was at work in the upper part of the building, and while so occupied dropped his brush down a large shaft. This shaft ascends from the ground to the top in a sloping and zig-zag manner, and contains several bends or angles. The painter, thinking his brush might have lodged upon the uppermost edge, leaned over, but losing his balance he was precipitated headlong into the shaft about 50 ft. It was impossible for any one to follow, and no one knew in what part of the shaft the man was, or whether he was alive. Great excitement prevailed amongst the men, as the brickwork at the bottom is of an immense thickness, and if broken through might jeopardise the safety of the upper structure.——The other case was that of a lad about fifteen, who was lathing for the plasterers, when the plank he was standing on gave way, and he fell about 15 ft. on the edge of a large tub beneath, and thence into the water. He fell upon his chest, and the injuries he received are likely to prove fatal.

Glasgow.—Mr. David Law, sen., and Mr. David Law, jun., builders, have been apprehended on a charge of culpable homicide, in connexion with the recent fall of a portion of a house in course of erection at Hillhead. They were afterwards liberated on bail of 200*l.* each.

Edinburgh.—A plasterer, in the employment of Mr. Baird, Pitt-street, has been killed, while engaged on a new building at Warrender Park. He ascended a scaffolding about 10 ft. in height erected in the stair of the building. While ascertaining whether the plaster was dry he felt the scaffolding moving, and in order to maintain his balance he leant backwards. Before he was able to recover himself, however, he fell, and, his head striking the stone steps, he was picked up insensible. The poor fellow was conveyed to the Royal Infirmary, where he died.——A mason, while employed repairing a chimney on the top of a five-storied building in Chester-street, overbalanced himself and fell to the ground from a height of about 50 ft. He was picked up insensible, and removed to the Royal Infirmary, where it was found that he had sustained a severe fracture of the skull.

SURVEYORS' CHARGES ON THE LAST GOVERNMENT CONTRACT.

Sir,—A rumour is going about, backed by the assertion of one of your correspondents, that the surveyors engaged upon Government work in taking out the quantities for the Home and Colonial Offices have charged 6,010*l.* for their work: this appears to be at the rate of 2½ per cent. upon the estimated cost, viz., 240,000*l.* Considering the character of the building, and its great size and the repetition of parts, about half of such a sum, I believe, would be the usual charge. Such an assertion, I think, ought not, for the interest of the profession to which these gentlemen belong, to remain uncontradicted; and I am sure they will thankfully accept the opportunity of setting the public right which the publication of this will afford them.

As the charges of the surveyor are added to the builder's tender, employers seldom know how they are paid; and this is another reason why the rumour should not continue, or the public may now think they are being charged more than the usual remuneration.

A. B.

*** It is perfectly correct, we are informed, that the surveyors' charges in the case in question amount to over 6,000*l.*, or 2½ *per cent.* on the amount of contract.

HORSE PERILS.

Sir,—I have just read in this day's paper of a fatal accident to three out of four ladies, through a runaway horse. It is possible to remedy this; and I again beg space in the *Builder* to explain my method of stopping the headlong speed of frantic and restive horses. A complete electric apparatus can be purchased in a small case. Let one of these be fixed in an out-of-the-way nook in the carriage, two wires to hook to harness, beneath which have two very thin copper plates properly placed. In the event of a runaway, the driver and inside occupants would only have to press a glass knob to stop instantly the mad career of the strongest horses.

R. T.

P.S.—It could be adopted for equestrians also.

NEW MASONIC HALL, RICHMOND, YORKSHIRE.

If the M.W.P.G.M. the Right Hon. Earl of Zetland has given up his bâton as commander-in-chief; at least he has not retired from the energetic practice of those high Masonic duties which have distinguished him as one of the most popular Grand Masters of England.

On the 23rd of September, assisted by the Provincial Grand Lodge of Yorkshire, he opened the new Masonic Hall in Richmond, for the practice of the ancient rites of Masonry; supplying a want which has been long felt by the brethren in this picturesque old town and its surrounding neighbourhood.

The ceremony of dedication was conducted with all the "pomp and circumstance" befitting the occasion, Dr. Camridge, of York, P.G.O., kindly presiding at the harmonium, with an ability worthy of a better instrument.

The hall, and site upon which it is built, are both the generous gifts of the noble earl to his Masonic brethren.

The hall is situated on a most commanding site in New-Biggin. The end elevation towards the street, and internal decoration, are in the Doric style. In the pediment over the porch the Masonic and Zetland arms are entwined.

The lodge-room is 50 ft. by 25 ft. by 25 ft., and is lighted by a dome in the roof. To the

right and left of the entrance-hall are cloak and refreshment rooms. A system of warming and ventilation has been adapted in the lodge-room, the main cornice of which and the dome-light are enriched with plaster-work.

The whole cost of the building and fittings was about 800*l*. Mr. Christopher Palliser, of Northallerton, was the architect.

THE OFFICE OF WORKS AND ARCHITECTS.

Sir,—I have read with great interest the letter of "A Tax-payer" which appears in your last impression. If it be true that the architects of Government works, who are themselves members of the Institute, have become parties to any agreement by which the Institute regulations are to be ignored, and its position as to the possession of drawings is to be abandoned, I for one am unable to see, unless these gentlemen resign their fellowships, what is the actual use of the Institute. I have no expectation that this letter will induce their withdrawal in such case: the Institute looks, I fear, too mercifully on all such sins of *commission*.

A Provincial Architect.

PURIFICATION OF THOROUGHFARES BY DELIQUESCENT CHLORIDES.

A paper on this subject was read at the meeting of the British Association in Liverpool (Section B, *Chemical Science*), by Mr. W. J. Cooper. In the course of it, Mr. Cooper stated that in many towns the salts have been tried this season, with various results, according to the nature of the roadway; and nearly all kinds of pavement have been experimented on at Westminster.

As soon as the area of the experiment at Whitehall and Knightsbridge was extended throughout the district, the saving in water and labour was at once made evident. By using one ton and a half of salts per day, costing 3*l*. 15*s*., the labour of ten horses, carts, and men can be dispensed with, costing 4*l*. 10*s*. (at 9*s*. per horse, cart, and man), and consequently the quantity of water they would put down is saved, viz., 350 loads of 250 gallons, or 87,500 gallons, which, at 10*d*. per 1,000 gallons (the average price for water in London), would amount to 3*l*. 12*s*. 11*d*. per day, in addition to the saving in labour of 15*s*. per day, showing a clear gain of 4*l*. 7*s*. 11*d*. per day, after paying for the salts.

The importance, in a sanitary point of view, of the use of these chlorides, has, Mr. Cooper said, been clearly established. "The deliquescent chloride of aluminium, recently introduced to public notice by Professor Gamgee," he continued, "seems to meet all the requirements needed in the antiseptic of the future, and I propose to add a sufficient percentage of this chloride to my patent salts for street watering."

STAINED GLASS.

Gloucester Cathedral.—Three painted glass windows have just been inserted in St. Paul's Chapel, the restoration of which is being carried out at the cost of the Earl of Ellenborough. They are the work of Messrs. Burlison & Gorylls, of London, and consist each of three lights, partially obscured by the reredos. In the centre window is a representation of the Lord, seated in majesty, clothed in a crimson robe and white mantle, and surrounded by an aureola, cherubim, and fourteen angels, kneeling in adoration, and holding palm branches and crowns. In the upper lights are six angels bearing scrolls inscribed "Te Deum laudamus." The side windows, which are an expansion of the central subject, have each ten angels arranged in four tiers, and playing upon various stringed instruments, pipes, and a small organ. The dresses are white, relieved with yellow, and the backgrounds throughout are blue, spangled with yellow stars. In the upper lights on the left are four crowns, and in those on the right four swords. Among the fragments of which the ancient painted glass formerly in these windows consisted were some quarries with the relics of Andrew Whitmay, and a tree or sprig of "white May," with entwined scroll. Andrew Whitmay, after holding certain local livings in the time of Henry VIII., became suffragan to the Bishop of St. David's, with the titular see of Chrysopolis (now Scutari), near Byzantium, and was prior of St. Bartholomew's Hospital, Gloucester.

Clifton Church, Yorkshire.—A memorial window of stained glass has been placed in the south aisle of this Church. The window has two lights, in which are represented Moses with the two tables of stone on one side, and Elias with a scroll on the other, the head lights bearing the monogram J. H. S. The window is from the works of Messrs. Hardman & Co., Birmingham, and has been placed in the church by Mr. Lawson, of Brighouse. The inscription states that it is in memory of the late William Byrne Lawton, of Clifton, and has been put in by his employers, Thomas Robson, Henry Byrne, and Samuel Henry Byrne, of Clifton Bridge, "in grateful appreciation of his faithful services and energetic usefulness." This, says our authority, the *Halifax Guardian*, is the only window of stained glass in the church.

Catton Church.—A two-light window has been placed in the west end of this church. The execution of the work was given by the late Dr. Wright to Mr. Smiddy, of Malton, who has carried out his commission. The subject is Christ Healing the Sick. Beneath the figure is the inscription, "He healed many that were sick of divers diseases;" and in another position "In memory of John Wright, surgeon, born 1792, died 1864; also of Sarah, his wife, born 1798, died 1867."

Sheffield Parish Church.—A new memorial window has just been put up in the chancel of this church. The window is the gift of Mr. Henry Unwin, and is in memory of his brother, the late Ald. Unwin. It consists of six lights, divided into an upper and a lower tier. The upper lights represent the five wise virgins on the dexter, and the five foolish virgins on the sinister sides, the centre light being occupied by a representation of our Saviour as the Bridegroom. Underneath are the words, "And they that were ready went in with him to the marriage; and the door was shut." The three lower lights represent three distinct subjects. The first is, "The Temptation of our Lord," and illustrates our Saviour and the tempter. The centre light contains a large figure of our Saviour, as "The Light of the World," the representation being an exact copy of Holman Hunt's picture. The last light has several figures in it, one of which bears a large sword, and underneath is written, "The Sword of the Spirit." The now only remaining unstained window in the chancel will shortly be filled by a stained window, which will be erected by Mrs. G. Hounsfield, to the memory of her husband. The window just put up comes from the establishment of Messrs. Camm, Smethwick, near Birmingham; and the brass is the work of Messrs. Parkin & Bacon, of Sheffield.

Sharrow Church.—In the south aisle a memorial window has recently been erected by Mr. Parkin, to the late Mrs. Parkin. It has a floriated ornamentation supporting a medallion, containing initials of the lady's name, surrounded by a border of lighter colour. It was executed by Mr. Camm, of Smethwick, near Birmingham. To the same artist is entrusted the execution of the memorial to be erected in the south transept to the late warden, Mr. Whitehead, who died so suddenly.

PROVINCIAL NEWS.

Northampton.—The plans for the new post-office in Abington-street, which have been prepared by Mr. James Williams, of her Majesty's Office of Works, have been sent down to Mr. Wetton. The front elevation of the building, which is devoid of ornament, consists of three stories, with three windows and a door on the ground-floor, and four windows on each of the other stories. On the basement will be the seizure store-room of the Inland Revenue department, store-room, letter-carriers' retiring-room, sorters' retiring-room, battery-room, coal-cellars, passages, stairs leading to sorting-office, &c. On the ground-floor will be the public office, with telegraph desks for the public, the postmaster's room, the sorting-office, telegraph instrument-room, messengers' room, &c. The first-floor will be devoted to the business of the Inland Revenue, and will contain a public office, surveyor's room, room for surveyors' clerks, collector's room, store-closet, lavatory, closets, passages, &c. The second-floor will also be devoted to the Inland Revenue, and will contain a journal office, supervisor's office, store-room, store-closet, lavatory, passage, &c. The work, we understand, will be proceeded with forthwith.

Wolverhampton.—That portion of the new corporation buildings in course of erection which forms the police-barracks is now finished. The barracks are at the rear of the new town-hall, and are approached from Red Lion-street. They will face a spacious drill-ground, and a broad verandah will run along the front of the barracks, which will form one side of the drill-ground. The first room entered is the charge-room, where persons taken into custody will be first brought. The room is large, light, lofty, and well ventilated, and a like description, modified according to requirements as to size, applies to every other room in the barracks. Adjoining are the apartments of the female searcher; while on either side of a long, lofty, and well-constructed corridor there open out inspector's sitting-room, sergeants' sitting-room, general reading-room and library, drill and conversation room, mess-room, kitchen, fitted with large cooking-apparatus, pantry, a drying-room, heated with hot water, and a store-room. A broad flight of stairs leads to some twenty-five bedrooms opening out of a corresponding corridor on the first floor. There are added a bath-room and other conveniences. Some nine months must elapse before the police force of the borough, who live in barracks, can change their present wretched quarters for their new lodgings. At present the principal rooms are the temporary offices of the borough surveyor, the rate-collector, and inspector of nuisances; and the meeting-place of the committees of the town council; and until the whole premises are completed, and the several offices and rooms provided for these officers and purposes are occupied, the police must remain where they are. To form the drill and barrack yard, a large quantity of earth and soil has to be removed. The whole of the works are progressing.

Barnsley.—New Gasworks, erected at Old Mill, for the Barnsley Gas Company, have been opened by the chairman, in the presence of Mr. C. Hawksley, of the firm of Messrs. T. & C. Hawksley, the engineers, and a number of the directors. The works are fitted with all the most modern appliances and improvements, and are capable of making a large quantity of gas. In the evening the whole of the workmen had supper in a large room at the works. Both the new and old works, together with the corn exchange and other public buildings in the town, were illuminated with gas devices on the occasion.

CHURCH-BUILDING NEWS.

Gayton (near Stafford).—The church here has been restored and re-opened. The work of restoration has been done by Messrs. Habershon & Pite, architects, London, and Mr. Whittome, of Stafford, has executed the work. Under the plans Mr. P. Fitzgerald has lengthened the chancel by 11 ft.; the plastered ceiling and gallery have been removed; the roof has been thrown open and lined with stained timber; pews have given way to comfortable benches; and a series of new stone arches, which open to a new south aisle, have been built. On removal of the gallery it was found that there would be a deficiency of sittings. For the building of a new aisle a new fund was opened, and the Earl of Harrowby, the Earl of Shrewsbury, and Miss Moore contributed towards it. A vestry has been also added to the north side of the church. Mr. Habershon says:—"The church retains several features of 'the olden time,' which have been scrupulously preserved. Among others, the fine Early Norman arch, with zig-zag and billet, is of peculiar beauty. It has been carefully restored. There is also a canopied recess in the north chancel wall, containing a recumbent figure of probably the twelfth century. Many old figured tiles remain which have been worked up in the aisles. Every ancient stone and every moulding connected with the church has been preserved and re-inserted. The prevailing style is Early English."

Accrington.—The church of St. John the Evangelist, Accrington, has been consecrated by the Bishop of Manchester. The church was built about two years ago, to supply an accommodation for public worship which had long been felt in the rapidly-extending district of St. James's. The style is Gothic. The edifice is capable of seating 882 persons, and half of the seats are free. The total cost was about 6,700*l*.; but there remains a debt on the church of several hundred pounds.

Frampton.—The parish church of Frampton has been restored and re-opened after consecra

tion. The church now consists of nave, north and south aisles, and a triple chancel, with arcades, and the chancel approached from the nave and aisles beneath broad archways. The porch is south, while most of the parishioners live in a northerly direction: it is supposed the southern end of the parish was the more populous when the church was built. But there is a facility of approach to the north door, which is reached through a pleasant avenue of chestnut trees. The earlier portions of the building are in the Decorated style, with modern insertions: the Perpendicular Gothic prevails in the windows and the tower. Last March, the building had to be closed, and soon after the vicar and churchwardens wrote of it that it had been inconveniently built for the purposes of public worship as conducted in modern times, saying:—

"Two large chancel aisles belonged to the lay rector, and were at one time enclosed by railings. Some years ago the vicar obtained the use of them for the parishioners, and they were fitted up with seats. But the blocks of masonry which supported the chancel arch were so large as to impede both sight and sound, and it was determined therefore to take down the arches which gave admission to the chancel and its aisles, and to rebuild them farther to the eastward, thus lengthening the nave and its aisles, and also to extend the central chancel to the eastward, so as to maintain its due proportion, and to provide space for the choristers."

For 1,050*l.* the contractor had then guaranteed to make these alterations and to put the building in a weather-tight condition. But as there was no provision for floor or seats or even renovating the interior of the walls, and the old timber was to be used in restoring the roofs, an additional sum of 250*l.* was required to make the church fit for divine service. As at Minsterworth, the architect of the restoration was Mr. Woodyer, of Guildford, and the clerk of the works Mr. Denney; and Mr. Chapel, of Tring, Hertfordshire, has carried out the contract. The two large side galleries have been taken down; the chancel has been extended 17 ft., and its arches rest on half pillars attached on the east side to the chancel walls and on the west to the piers which form a common support for the arches of the nave and side aisles; the chancel aisles, each lighted by three windows, have been thrown into the nave; the thick buttresses impeding light and sight and sound have been removed to the beginning of the new chancel, and much lessened in size; the walls have been cleaned and replastered; the organ has been removed from the north to the south aisle, while pews for the Court fill the former; there are some seats for the choir in the chancel, and several new seats appear in the church. The pulpit has changed sides. The open-timbered roof has been in part unveiled; and, outwardly, there is a new covering of Tetbury tiles to the chancel and aisles, and the churchyard has been extended. The old oaken chancel-rail remains, and so do the open seats with bench-ends, oaken doors, and linen-fold patterns; and the stone and brick floors have been untouched, but that in the chancel and aisles will be renewed when money is forthcoming. The Perpendicular east window is new, in memory of the late squire, Mr. H. C. Clifford, is by Clayton & Bell, and has the Crucifixion for its central subject; and there are two painted windows in memory of the Watts family. The west window, in the first of the three stages of the tower, has been recently filled by the relatives of Mr. Thos. Watts. The south window bears the date 1734, suggesting some restoration of the work at that time. The stone seems to have been brought from Ireland.

Hanley.—The old Church of St. John, Hanley, has been re-opened, after having been closed several weeks for alterations and repairs. The most material alterations made in the building are the removal of the old ceiling and the substitution of an open woodwork roof. This has not only had the effect of improving the appearance of the interior, but also of diminishing the degree of effort necessary to be put forth by the minister in order to make himself distinctly heard in all parts of the building. The organ has been removed from the western gallery, and two windows therein, which had been built up, have been re-opened and filled with tinted glass. The interior has been cleansed, and repainted in a simple style, and in one or two minor particulars improvements have been made. The cost of the recent alterations is 500*l.* The sum of 450*l.* has already been subscribed towards the contemplated re-building of the chancel.

Tamworth.—Elford Church has been re-opened, after undergoing alterations and improvements, at a cost of about 3,000*l.*, which has been borne solely by the Hon. Mrs. Howard, of Elford Hall. The architect was Mr. G. E. Street, of London, and the builders were Messrs. Charles Clarson & Son, of Tamworth. The church is of very ancient date. The chantry chapel contains a new painted glass window, representing the Ascension of our Saviour, executed after a Dresden design by Messrs. Ward & Hughes, of London.

Everton (Liverpool).—The foundation-stone of the Church of St. Ambrose, Prince Edwin-street, Everton, has been laid. The new edifice is intended to meet the wants of the rapidly-increasing population of Everton, and will be an auxiliary to the Church of St. Peter, Sackville-street. The Church and School Extension Society have given 1,000*l.* towards the site and 3,000*l.* towards the building, the cost of which is expected to be about 5,500*l.* Mr. G. E. Grayson, of Liverpool, is the architect, and Messrs. Burroughs & Sons, of Liverpool, are the builders. The style of the new edifice will be Early Decorated Gothic. There will be a nave, chancel, north and south aisle, and two west porches, and sittings will be provided for 700 persons. Ornamented brick will be used in the construction inside and outside.

Southampton.—The church of St. Lawrence, which has been closed for a week or two for cleaning and decoration, has now been re-opened for divine service. The chancel has been decorated from the designs and under the superintendence of Mr. Charles Vaughan, of Southampton. The triplet of pillars supporting the chancel arch are brought out in Aberdeen granite, as are also the pillars that support the groined roofs of the body of the chancel and its apsidal termination, and the pillars supporting the hood mouldings of the three windows of the apse in porphyry. The mouldings of the chancel and apse arches being of an exceptionally plain character, diapering has been employed, the fleur-de-lis (as an emblem of the Trinity) being in the outer moulding, the endless oval (as an emblem of eternity) marking the architrave, a leaf of the soffit edges imparting the appearance to the distant observer of the characteristic tooth-ornament, while the soffit is relieved by the grape and iris leaf (as an emblem of purity). The walls of the chancel and ribs of the groined roof are of Caen stone coloured, the bosses being in vermilion, picked out in blue and gold, and the roof sky-blue. On the semi-sexagonal apse the most elaborate part of the work has been bestowed. The side walls up to the window string-course are in maroon, with gold fleur-de-lis, the centre space being filled by a cross surmounted with the kiro, the candles, and other belongings of the altar. The capitals of the pillars that support the hood mouldings of the windows and the groined roof of the apse are decorated in gold, blue, and red, the ribs—of Caen stone colour—being relieved by a leaf moulding, and the roof itself is in ultramarine blue with white stars. The three single lancet windows are in stained glass, erected some years ago, and have, as the central design, the Baptism, with the Agnus Dei as the dexter and the pelican the sinister lights, and the jambs are ornmented with the iris leaf.

SCHOOL-BUILDING NEWS.

Abington.—A new school for the parishes of Great and Little Abington, built at the sole expense of Mr. E. J. Mortlock, has been opened by the Vicar of Great Abington. The school consists of a main room, 40 ft. by 18 ft., and also a class-room, 15 ft. square. It is built of red brick, the window-cells being of Ketton stone. By the liberality of the same gentleman the chancel and greater part of the nave of Great Abington church have been entirely reseated. A field also has been granted by Mr. Mortlock as a recreation ground for the use of the poor of both the Abingtons.

Bristol.—The new building in St. Philip's, intended for ragged schools, mission church, and soup kitchen, according to the local *Times*, is nearly completed. It consists of two large rooms, with class-rooms annexed, capable of accommodating nearly 400 children. Under the class-room is a soup-kitchen, now being fitted up. A small playground has also been secured. One of the class-rooms has been opened for mothers' meetings and serving classes; and the boys' room will be opened as a day, night, and Sunday school as soon as possible. An appeal is made for funds.

Hyde.—The corner-stone of St. George's new school has been laid. The school, which will be entirely of stone, will be built in a Gothic style, and will contain three class-rooms. It will be 100 ft. by 40 ft. in extent, and will accommodate about 800 scholars. The total cost will be 1,150*l.*

Worcester.—St. Clement's new Boys' School-room has been opened. It is built on a space hitherto used as a playground, and adjoining the present schools. The ground was somewhat irregular in shape, but Mr. Ernest A. Day, the architect, has made the most of it. The front wall is close up to the line of Church-walk, the entrance being at the end near to that by which access is obtained to the existing schools. A space of 9 ft. at the end has been reserved for a porch and cloak-room, the remainder being the school-room, the dimensions of which are 47 ft. by 20 ft. The roof is an open one, the interior height being 12 ft. to the wall-plate, and 28 ft. to the apex. The dressings of the building are stone. The school affords accommodation for 117 boys.

Manchester.—The foundation-stone of the Albert Memorial Church Branch Schools has been laid. The site is at the junction of Sanderson-street and Rowbotham-street, and contains 12 square yards. There is to be a mixed school, with porch entrances from Sanderson-street, and class-room adjoining, and an infants' school with separate porch from Rowbotham-street. Built in the Gothic style, the edifice, which is to be about 75 ft. long by 26 ft. wide, will be faced with selected bricks, and relieved with coloured bricks. Adjoining the school building a teacher's residence will be erected. The plans have been prepared in accordance with the requirements of the Privy Council, and each of the rooms is well fitted, affording accommodation for 231 children. Playgrounds will also be provided. The cost, including inclosure walls and fittings, is 1,250*l.* Messrs. Wade Brothers, of Miles Platting, are the contractors for the whole of the works, under the superintendence of the architect, Mr. John Lowe, Manchester. The building will cost about 800*l.*, towards which Government has given 250*l.* The site, worth 400*l.*, has been presented by Mr. Howarth, of Bristol.

Kennington.—The first stone of a National new School-room has been laid at Kennington. It would seem that the Regency-square School has been established about fifteen years for the education of boys and girls in connexion with the Established Church. Lately the number of scholars has greatly increased, and this fact, together with the necessity of having separate schools for the boys and girls which did not heretofore exist, made it desirable to build another school, and accordingly a piece of ground at the rear of the present school was selected for that purpose. The building is to cost 600*l.* The architect of the school is Mr. Charles Gould; and the builders are Messrs. Nixon & Sons.

Hollington.—A new school has just been built in this village, and opened. The school, with a class-room and master's house attached, has been erected at a cost of 900*l.* It is in the Elizabethan style, of Hollington stone, rock faced. Mr. Christian, of London, is the architect; and Mr. William Thorley, of Ellastone, the builder.

Luddenden Foot.—The corner-stone of the new schools near to Blackwood Hall, just above the station, has been laid. The schools are to receive 300 children. These schools are being built after the designs of Messrs. Parr & Strong, London, and they are to consist of mixed and infant schools, with master's residence. The larger room when ready is to be used for divine service on Sundays, until the completion of the church, which is to be commenced early in the next year. The school buildings with their gables, and the church with its lofty spire, will eventually form a group seen from Brierley, Midgley, and the surrounding country.

Newcastle-under-Lyne.—The foundation-stone of a new school for girls has been laid at Chesterton. The building will consist of a school-room, 50 ft. by 20 ft.; class-room, 15 ft. by 14 ft.; porch, lavatory, furnace for boiling water for tea, and the usual outbuildings and play-ground; to be built of red bricks, with stone traceried and mullioned windows; but the copings and buttress set-offs, usually done in stone, are to be of Staffordshire blue brick and tile ware. There will be open stained roofs covered with tiles. The style of the buildings will be Decorated Gothic, similar to the existing schools adjoining. The architects are Messrs. Ward & Son, of Hanley, and the contractor is Mr. Lea, of Chesterton.

Rothwell.—The new Free Grammar Schools

recently erected in Rothwell have been opened. The new edifice is situate at the east end of the town, on the site of the old school, and faces the street. It was built by Messrs. Barlow & Butlin, of Rothwell, builders, from a design by the rector. There is a residence for the master. The main building is capable of being divided by folding-doors into two large rooms, one being intended for girls and the other for boys. The boys' room is 40 ft. by 18 ft., and the girls' 38 ft. by 18 ft., and to each a class-room is attached. The height of the side walls is 15 ft. The roof is of open deal, stained and varnished. The school is lined with Harborough pressed bricks, the external material being "chopped" native stone, with white stone quoins. The estimated cost of the new building is 650*l.*, the materials of the old building having been utilised as far as possible. The school will accommodate upwards of 200 children.

York.—New church day and Sunday schools have been opened in the Walmgate district. A large plot of ground, of the value of more than 400*l.*, was placed at the disposal of the rector and churchwardens, on which to erect the schools. The ground for the parsonage-house, now in course of erection, near the schools, was purchased of the corporation for 300*l.* The schools, which are intended, as day, Sunday, and infant schools, with the addition, in winter, of night-classes, have been erected and fitted up in accordance with the rules laid down by the Committee of Council on Education, and consist of schools for boys, girls, and infants, each 36 ft. by 18 ft., with class-rooms adjoining. The front, towards the Church of St. Denis, is of red bricks and stone dressings. The play-grounds, which are spacious, are surrounded by a low wall and ornamental palisades. Mr. Rawlins Gould, of this city, was the architect employed, and the work has been executed by the following contractors:—Mr. Biscombe, for brick, stone, and plaster work; Messrs. W. Bellerby & Sons, joiner's work; Mr. T. F. Wood, slating; Mr. R. Walker, plumbing and glazing; Mr. W. Walker, ironwork; and Mr. Armitt, painting. The cost of erecting the buildings has been upwards of 1,400*l.* In the schools about 250 children, in the whole, can be accommodated. The interior woodwork and fittings consist of plain deal stained and varnished.

Tunbridge Wells.—The memorial stone of new schools has been laid here. Mr. J. Wimble is the architect, and Messrs. Willicombe & Oakley are the builders. There are at present between 200 and 300 children attending the school and eighteen teachers. One principal room will be 50 ft. by 25 ft.; the second room, 15 ft. by 15 ft.; over that and the staircase there are to be two more rooms, one for a young men's class and the other for a library, and at the back there will be two other rooms for the use of the church-keeper and the parsonage-house.

Leicester.—St. Martin's Schools have recently been much enlarged and extended by taking in the part formerly used as the master's residence, and bringing the front forward to the line of the street. Formerly there were only two common school-rooms, one for boys and the other for girls, but the alterations have added three good and airy rooms for classes to each department. The old part of the building has been renovated, new flooring having been laid down, and walls and panelling erected where required. The alterations and additions have been carried out under the direction of Messrs. Shenton & Baker, architects, at a cost of 1,250*l.*

Books Received.

Perpetuum Mobile; or, a History of the Search for Self-motive Power, from the Thirteenth to the Nineteenth Century. Second series. By Henry Dircks, C.E., LL.D., &c. London: Spon, Charing-cross. 1870.

Perhaps it may be something new to many of our readers to be told, that since the opening of the present century, and not a few of them quite recently, at least eighty-six English patents and twenty-three French ones, for perpetual motion, have been obtained, or at least asked for, in this country. Though actually for perpetual motion, these patents are in general said to be for the obtainment of "motive power." They are all, however, for the obtainment of self-motive power, by means of mechanical contrivances, combining levers, wheels, and weights, water and air, to go on for ever, or at least as long as the materials last, and without any continuous supply of motive power, such as winds or tides, steam, water-falls, &c., might afford. The true nature of these "motive power" patents we have now and then spoken of, and adduced as curiosities, but Mr. Dircks records them at considerable length, and a strange and lamentable exhibition of misused mechanical ingenuity they do form.

Amongst the more recent patentees (1865), we observe, is Mr. James Smith, of Liverpool, a practical man of business, if we mistake not, but also a noted squarer of the circle, about which he is ever and anon squaring up to ex-Professor de Morgan, the mathematician. Conjointly with some wrong-headed mechanic, Mr. Smith, as a capitalist, gives his name (and his money) to four patents, and one abortive application for a patent, for a self-moving engine to supplant the steam-engine; and on which, according to Mr. Dircks, he has spent between 8,000*l.* and 10,000*l.*, with the usual result of "wait a little longer." Baron von Rathen, who, a good many years since, endeavoured to bring into use an engine worked by compressed air in iron bottles, appears now (or at least in 1865) to have joined the corps of crazy self-motive power seekers, by taking out a patent for retaining the compressed air motor in perpetual activity by causing the engine itself to work an air-compressing apparatus.

Although, in general, the modern perpetual movement seekers keep the idea of self-motors discreetly in the background, so far as words are concerned, this is not always the case. Two poor French fellows, labouring under a twofold ignorance of the English language and of the laws of mechanics, boldly speak of their patent of 1867 as being for "the use of all kind of industry, and called the perpetual movement;" and they thus describe the application for provisional protection, which, however, was mercifully refused:—

"This machine or apparatus is of triangular form, and has for motrical power the pression and force of a weight which keep continually raizing a smaller one, which is what constitute and produce its perpetual movement. Its march cannot be empeach by anny shoocks of anny kind whatever. Any system of escapement known can be applied and regulate its march and direct it at will. All kinds of connections can be applied to it according to the wants required. It can also be adapted to clocks."

In *Notes and Queries*, Mr. De Morgan thus vigorously defines the impossible problem of the perpetual motion:—

"The purse of Fortunatus, which could always drop a penny out, though never a penny was put in, is a problem of the same kind. He who can construct this purse may construct a perpetual motion; in this way. Let him hang the purse upside down, and with the stream of pence which will flow out let him buy a strong steam-engine, and pay for keeping it at work day and night. Have a new steam-engine ready to be set in motion by the old one at its last gasp, and so on to all eternity. A perpetual motion demands of the nature of things a machine which shall always communicate momentum in the doing of some work, without ever being fed with any means of collecting momentum. It could be compassed in a certain way,—that is, by retaining the work done to do more work, which again should do more, and so on—if friction and other resistances could be abolished, and nothing thrown away. In this way the fall of a ton of water from a reservoir might be employed in pumping up as much water into another reservoir, which, when landed, if it be lawful to say so of water, might, by its subsequent fall, pump up an equal quantity into the original reservoir, and so on backwards and forwards, in *secula seculorum*. But not a drop must be wasted, whether by adhesion to the reservoir, by evaporation, by splashing, or in any way whatever. Every drop that falls down must be made to raise another drop to the same height. So long as the sockets have friction, or the air resists, this is impossible. In fact, matter, with respect to momentum, has the known qualities of a basket with respect to eggs, butter, garden-stuff, &c. No more can come out than was put in; and every quantity taken out requires as much more to be put in before the original state is restored. So soon as the law of matter is as clearly known as the law of the basket, there is an end of looking for the Perpetual Motion."

The history of perpetual motion, says Mr. Dircks, is a history of the fool-hardiness of either half-learned, or otherwise totally ignorant persons.* In the infancy of sciences, whether medicine, chemistry, agriculture, mechanics, or others, there were of course, some errors which received a certain amount of favour, and even encouragement; but the crudities of every science are fast disappearing.

Were we to admit for argument's sake that some delicately arranged instrument might possibly be contrived to show a tremulous action, its accomplishment would not be of the least practical value, or reward the toil and anxiety of its inventor. But although inventors have sought a power exceeding the steam-engine in some cases, while others have satisfied themselves with more lowly designs, based on capillary attraction, neither the one nor the other has attained the faintest shadow of success. From the infant machines projected in the thirteenth century to the last hydraulic, pneumatic, weighted, and lever-worked pretensions, patented as motions, no motion whatever has resulted from the one or the other to the present day. Not a solitary discovery is on record, not one absolutely ingenious scheme projected, or one simple self-motive model accomplished. Under such circumstances, what shall we say of the modern mechanic who shall hereafter presume to add his dreary dreams to the lifeless lumber of the last seven centuries? No language can be too severe in denouncing the continuance of research in this insane undertaking; nor any criticism too sarcastic in exposing the foolish results pompously published by a class of blind, deaf, and doggedly stupid projectors; who, bringing obloquy on themselves, are a discredit both to their country and to the present enlightened age. Nothing can excuse the fostering of such crazed conceits as the present history records, curious in themselves, as regards olden times, but ridiculous in a modern garb; they are, therefore, presented here as a warning to simple-minded experimenters and novices in mechanical science, in the hope thereby effectually to break the neck of this monster mechanical delusion.

Mr. Dircks's history is illustrated by engravings from various authentic sources, in papers, essays, letters, paragraphs, and numerous patent specifications, and is preceded by an interesting introductory essay.

* And yet we find that the more recent patentees of whom we have just spoken comprise a colonial bishop, a professor of philosophy, and another of languages, two barons, a knight of the most noble and ancient order of the Temple, four military men, a doctor of medicine, a barrister, several gentlemen, two civil engineers, several mechanical engineers, a brass manufacturer, miller, millwright, smith, saddler, bobbin manufacturer, surveyor, and a geologist, besides others whose professions are not named.

A Short Historical and Architectural Account of Llanercost Priory. By R. S. Ferguson, Barrister-at-Law, and C. J. Ferguson, Architect. London: Bell & Daldy.

In the compass of a pamphlet the Messrs. Ferguson have given an interesting account of Llanercost, an Abbey of Black Canons, eight miles from Carlisle. The buildings are beautifully situated in the valley of the river Irthing, close to the Picts' wall, and are mostly of the thirteenth century. Two photographs of the buildings, and a measured plan, agreeably illustrate this welcome essay.

VARIORUM.

Mr. Allnutt's "Record and Historical Map of the War" shows the routes of the French and German armies, the situation of the battles, and the towns surrendered. It tells with a few lines and flags the tale of an astounding series of triumphs. The same gentleman also publishes a diagram showing the highest price of Consols each day during the war, from July 1 to September 30. The range is from 93¼ down to 88½.——The October Number of *Home News for Australia*, 64 pages, is a remarkable digest of remarkable news, and reads like a volume of universal history.——The list of contributors to Mr. Tom Hood's *Comic Annual* this year will include, among other well-known authors, Mr. Leland (Hans Breitmann), whose contribution will be the first of his writings to appear originally in an English periodical. The Brothers Dalziell will execute the engravings. The result will doubtless be popular.

Miscellanea.

Parcels Trains.—The attention of the Post-office authorities is called, by the *Echo*, to the great want of a cheap parcels delivery throughout the country, so that, for a few pence, an interchange of commodities, in retail, might be promoted to an immense extent between towns, and especially by help of the halfpenny postage-card, of which tradesmen, as well as their customers, will make constant use. A Londoner, for example, wants a small roll of the tasty spiced mutton, or beef, freshly "cured," of which a Paisley tradesman advertises him by post-card. He cannot get it in London, except at enormous cost, and not fresh, from some West-end tradesman. He orders it from Paisley by post-card, or by enclosing stamps or order, and gets it next day, carriage 3d. or 6d. No end of such cases might be adduced.

The Architectural Society of Northampton.—The annual meeting of this society has been held. The proceedings of the day (and a very fine day it was) commenced with an excursion, the rendezvous being the Castle Ashby station. There the members from the west assembled. The train from the east end of the line coming later, there was time for the earlier comers to visit Earl's Barton, which was not in the programme. The party afterwards proceeded successively to Grendon, Strixton, Bozeat, Easton Maudit, Yardley Hastings, Castle Ashby, Whiston, and Cogenhoe. The meeting was held in the Assembly Room, the Rev. Lord Alwyne Compton in the chair. The report, which showed an unexpected surplus in hand, was read and adopted, and office-bearers elected. The Rev. Owen Davys then read a paper on the Choral Arrangement of Churches. Mr. Davys was of opinion that in cross churches the best place was in the centre, when the organ should be suspended as at Ely. When the choir is in the chancel, the organ should be placed behind it. He objected entirely to placing the organ on the ground. The musical effect was far superior from above than from below. The choir should be isolated from the congregation. The Rev. H. J. Bigge then read his paper "On the Connexion of Architecture with Freemasonry, and on Masons' Marks." The Rev. G. A. Poole denounced as a fallacy the supposition that the Freemasons of the Middle Ages had any connexion with modern Freemasonry. They were of no greater authority, he said, than the other guilds; and he repudiated the notion that modern Freemasonry had any title to take part in the religious ceremony connected with the laying the foundation of a church, when they were not in reality masons at all.

City Commission of Sewers.—On Tuesday the Streets Committee brought up a report recommending that the carriage-way of Moorgate-street and Finsbury-pavement should be paved with asphalte of three different descriptions. They stated that they had received applications from Mr. Barnett, the patentee of iron asphalte paving, and the Limmer Asphalte Company, to be allowed to lay down specimens of their asphalte, by way of experiment, in some parts of the city, and that in consequence they had considered it expedient to try in Moorgate-street and Finsbury-pavement those descriptions of asphalte and that of the Val de Travers Company, the thoroughfares having a different class and amount of traffic from that in Cheapside and the Poultry. The cost of the experiment would be 4,620*l.* in the case of the Val de Travers Company, who would have the largest space allotted, and 169*l.* in that of Mr. Barnett for a paving of 250 square yards. The Limmer Company offered to pave gratuitously 500 yards, and to keep it in repair for a year. The report created some discussion, and eventually an amendment by Mr. Deputy Farrar, postponing the consideration of the report for six months, was carried by a majority of ten in a Court of forty-four members. On the recommendation of the same committee, orders were given to pave with wood a portion of George-yard, Lombard-street, at the suggestion and expense of Messrs. Barclay, Bevan, & Co., the bankers.

Liverpool Master Builders' Association. The fourth annual general meeting of this association has been held at their rooms in South Crescent Chambers, Lord-street. The committee presented their annual report and balance-sheet, which were adopted. They congratulated the association upon its success in dealing with the labour question, which has brought the relationship between the great majority of the operatives and themselves into a more satisfactory state than has existed for many years. Should any dispute again arise in the bricklayers', masons', carpenters' and joiners', or painters' branches of the building trade, provision is made in the rules for referring such disputes for settlement to a public court of arbitration, instead of resorting to strikes or locks-out, as has hitherto been the practice. The following gentlemen were elected the officers for the year, viz.:—Mr. Edward Hughes, president; Mr. George Rome and Mr. Thomas Urmson, vice-presidents; Mr. James Landale, treasurer; Messrs. S. H. Holme, R. Makinson, S. Lyon, E. Gabbutt, C. Wells, James Leslie, Jones, W. Witter, J. Corkill, P. O'Connor, Thomas Harrison, John Tanner, W. Callaghan, T. Arrowsmith, John Price, W. Merrick, and D. Radcliffe.

Steam Cultivation.—A visit to Mr. Edmund Ruck's farms, at Braydon Manor, Charlhams, and Castle-hill, has been described in the *Wilts Standard*. The party, it is said, were wonderfully struck with the vast improvement both in the grass and the tillage. The tillage was in a beautiful state, principally due to steam cultivation, which was going on in force, on Fowler's system. Of the 300 acres, rather more than 150 acres are under steam cultivation for wheat crops, which Mr. Ruck believes the land capable of producing in good quality and quantity continuously, the crops after clover, beet, or beans not having been so good as wheat after wheat. At the time of the visit to Braydon, Messrs. Slatter & Porter's 10-horse double engine was at work on the land, having been there eighteen days, during which time it had ploughed the 150 acres nearly twice over, doing its work in a capital manner, and much to the satisfaction of both Mr. Ruck and his friends. It was interesting to witness the contrast between Mr. Ruck's farm and the lands adjoining, which are under the old-fashioned treatment; the visitors endorsing Mr. Ruck's opinion that all the poor land now lying in "Braydon Forest," and let at from 7*s.* 6*d.* per acre, may by means of the steam cultivator, and capital combined with skill, be made in a few years worth 2*l.* or 3*l.* per acre, and that some of the finest crops may be grown there, although it was a local proverb that "nothing good came out of Braydon."

The Drainage of Middlesbrough.—Mr. Robert Morgan, C.E., of the Local Government Act Office, has made his report upon the two schemes for the drainage of Middlesbrough. He says there are 7,000 houses in the borough, of which 406 only have water-closets, the remaining having covered ashpits. The ex-borough surveyor (Mr. John Dunning) estimates the cost of his scheme at 22,669*l.* 16*s.* 6*d.*, and the borough surveyor (Mr. Latham) estimates the cost of his scheme at 17,641*l.* 5*s.*; but to this sum must be added the cost of sewers in the north portion of the town, viz., 3,170*l.*, which makes the total 20,811*l.* 5*s.* After fully explaining the schemes, Mr. Morgan says,—"That of the two schemes before me Mr. Dunning's deals most comprehensively with the requirements of the town, and may, with certain modifications, additions, and combinations at certain points with Mr. Latham's scheme, be adopted with advantage by the Town Council." Mr. Morgan concludes his report as follows:—"I therefore recommend that Mr. Dunning's plan for the sewerage of Middlesbrough, with certain modifications, be adopted.'

City Offices Company.—An extraordinary general meeting of this company was held on Thursday in last week, at St. Clement's House, Clement's-lane, Mr. Ald. Dakin in the chair. The chairman, in moving the adoption of the report and accounts, said there was no material alteration in the balance-sheet except in one amount, which might be considered very satisfactory, received for surrender of the lease of the Cornhill premises. Those premises were held by the Crédit Foncier Company on a lease, of which 1¾ year had yet to run. The rent under that lease would amount to 11,375*l.* The Crédit Foncier manifested a great desire to surrender the lease, and ultimately their offer to pay 10,000*l.* and surrender was accepted. In addition to this, the City Offices Company had an accruing interest running over the period, which would bring in 500*l.* in addition. Within the last few days the ground-floor and basement of the premises had been let to a banking firm for 1,000*l.* a year, and the directors had great hopes that they would be enabled to let the remainder of the premises at a good rental.

A Water-tight Rain-Tank—I took out the soil in breadth and depth the size I wanted my tank; I then laid a double course of brickbats, and ran Portland cement in among them till they were just covered; I then built up the sides with brickbats and Roman cement, and when the whole was finished, I coated the inside with a thin layer of Portland cement. Every bat, before it was laid, was dipped into a pail of water. The months of April, May, June, July, and August are the best months in which to construct such tanks, because the cement has the chance of getting firm before being rendered shaky by frost. Mine was made just about midsummer. I ought to say that it was not made for the purpose of catching rainwater, but for holding a daily supply of river water; but I am convinced the same principle of construction would apply to tanks for any purpose or position.—*Gardener's Chronicle.*

Irish Cairn Sculptures.—At the last meeting of the British Association, a paper "On Ancient Sculptures and Works of Art from Irish Cairns," by Dr. Conwell, was read. The author described an excursion which he made on June 9th, 1863, to the Loughcrew Hills, two miles from the town of Oldcastle, where he found the remains of thirty-one cairns, partially destroyed, no allusion to which could be find on the Ordnance maps. The rural population of the neighbourhood believed these heaps of stones to be the magical work of a witch. Fourteen of the cairns contained chamber stones richly covered with sculpture; in some cases the work being punched, and in others clearly and cleanly cut and engraved. He exhibited drawings of the devices; also a variety of curious articles in amber, bone, glass, bronze, iron, stone, &c. Dr. Conwell could give no explanation of the meaning of the numerous devices and symbols.

Sales of Land.—*Cockermouth.*—The Lorton Hall estates were sold by auction, under a decree of the Court of Chancery, at the Globe Hotel, Cockermouth. Lot 1, consisting of 109 acres, or thereabouts, situate near to Lorton Hall, and known as the Church Stile Estate, was sold for 6,010*l.* Lot 2, the Home Farm, containing 65 acres, was purchased for 3,750*l.* Lot 3, Capshows, consisting of 21 acres, was knocked down for 900*l.* Lot 4, Brooms, containing 23 acres 2 roods, was knocked down for 250*l.* Lot 5, Flatt, consisting of 6 acres, was purchased for 420*l.* Lot 7, Highside, consisting of 41 acres of arable, pasture, and wood land, and 64 acres of common land, was sold for 2,160*l.* *Swindon.*—Mr. Dore sold by auction a piece of land situate on the south side of the proposed new road leading to the Swindon railway Station, and immediately opposite the goods shed, containing 6*a.* 0*r.* 36*p.* The land previously offered, and belonging to the same estate, had sold in some cases as high as 10*l.* or 12*l.* a perch. Messrs. Thomas Arkell became the purchasers at 1,850*l.*

South Kensington School of Science and Art—On Tuesday afternoon Dr. Zerffi commenced a new course of forty lectures on the Historical Development of Ornamental Art, in the Lecture Theatre of this institution. The lecturer said students would no longer receive merely practical instruction, which might have the effect of turning them into machines, but they would also be made thoroughly acquainted with the theory of art, in order to expand their minds and powers of production. He would endeavour, by avoiding all one-sidedness in the treatment of his subject, to give them the best of the realistic, historical, and critical schools; to develop in their minds a thorough knowledge of art, enabling them to arrive at originality.

The New Foreign Cattle Wharf.—Besides the large sheds for cattle, and the space for tying cattle in the open, there are pens for 2,500 sheep; and slaughterhouses and offices are being erected. There are three slaughterhouses, each of 60 ft. length by 30 ft. width, and seven houses, each of 48 ft. length by 16 ft. width, these being built of strong timber uprights and plates, with plank floors and walls, and the carcasses are suspended to stout beams, "crabs" being provided for hauling up the slaughtered cattle. The accommodation is said to be sufficient for the butchering of 700 cattle per day, and 1,600 sheep have been killed and dressed in a day.

Gathering of Public Servants, Coventry. A social gathering of public officers and servants of this city, was held at St. Mary's Hall last week. The city surveyor, Mr. E. J. Purnell, and his assistant, Mr. Whitley, jun., had arranged that a dinner should be given to the various men in the employ of the corporation, the expenses for which were raised by voluntary contributions, and the dinner was well served by Mr. Whitley, senior. The hall was decorated. Mr. Councillor Crutchlow occupied the chair, and Mr. Bird, master of the workhouse, the vice-chair.

Municipal Offices, Liverpool.—It was stated at a recent meeting of the Liverpool town council that the cost of the newly-erected municipal offices in that town was 162,637*l.*, including 33,000*l.* for the site, and that the annual expenditure on the establishment would be about 3,000*l.*

Cregeen's Sash and Casement Fasteners.—In these fasteners no spring is used. A hinged catch locks the fastener when in its place.

Building Trades' Institute for Technical Education.—On Tuesday evening the annual meeting of the Manchester and Salford Building Trades' Institute for Technical Education, took place at St. John's Schools, Gartside-street. The chair was taken by Mr. W. R. Corson; and there were also present Messrs. Jacob Bright, M.P., W. R. Callender, jun., Alderman Rumney, T. Clay, and others. The secretary then read the report, which stated that the industrial supremacy of England had been endangered for lack of knowledge, and that in spite of the practical aptitude of her people. It was therefore somewhat gratifying that though the number of members was not very large, yet there was reason to believe that the interest in the Institution was becoming more generally appreciated by those for whose benefit it was established, and that the session that was about to commence would be an improvement on the last.

The Technical Education Movement.—The deputation from a committee of a proposed university for technical education has had interviews with the Lord Mayor at the Mansion House. At the last interview, Mr. Alderman Gould explained that the deputation had brought up their report in an amended form. The amended report was read by Dr. Mill, and the Lord Mayor having expressed his approval of it, he was requested to allow his name to be put down as chairman of the executive committee, and to call a public meeting. In reply, his lordship said he had no objection to try the experiment, and by holding a meeting they would be able to ascertain whether the public were with them. If the public were not with them, they must wait till they were.

Ruyton Towers, Salop.—The owner of this castle presided in person at a dinner which he gave to eighty workmen and others, in celebration of the completion of the centre and left wing of the building, on Monday last. The building is somewhat Norman in character, and is erected with red sandstone, in massive proportions. The architect, Mr. Harry Percival, of Newchurch, in Rossendale, put in half a mile of railway to a quarry which he opened on the estate, and he has erected the structure without external scaffolding, and by the aid of ordinary workmen in the locality. The great hall and marble staircase, with a bold window of six lights thereon, by O'Connor, of London, are chief features.

A Draughtsman to Liverpool Council.—At a recent meeting of the Liverpool Town Council, Mr. Alderman Weightman moved the adoption of the following recommendation, agreed to by the improvement committee:—

"To appoint Mr. Edward Rake as draughtsman, to prepare the necessary drawings, &c., for the lodges, entrances, and bridges, at Sefton Park, at a salary of 7*l.* per month, subject to one month's notice."

Mr. Fairhurst remarked that there were five draughtsmen in the borough engineer's office who were under notice to quit, and he thought that one of them should get the situation. After some further conversation, Mr. Weightman withdrew the recommendation for the present.

Laying the Memorial Stone of the Church of St. Columb, Omagh.—The Duke of Abercorn laid the memorial stone of the parish church of St. Columb, Omagh, on Saturday, 8th, in the presence of a large number of the parishioners of Drumragh. The total cost of the building will amount to about 5,400*l*, the greater part of which sum has been contributed by the parishioners, the balance being a grant made by the late Ecclesiastical Commissioners for Ireland. The Duke addressed the meeting.

Large Transactions.—The report of the directors of the Conservative Land Society, submitted to the shareholders, at the meeting on 10th inst., at the Norfolk-street Offices, gives the receipts for the quarter, which were 36,693*l*. 7s.; for the financial year ended at Michaelmas, 133,276*l*. 15s. 11d.; and the grand totals, 1,583,359*l*. 15s. 2d. The withdrawals were 399,971*l*. 3s. 9d. The reserve fund is 10,500*l*. The auditors were re-elected, and the report adopted. Viscount Ranelagh occupied the chair.

Chairmanship of Board of Works.—The *Parochial Critic* prints the circular letter of five applicants for the appointment, viz.:—Mr. C. Westerton, Mr. Robert Freeman, Mr. P. H. Le Breton, Mr. John Savage, and Lord Robert Montague.

The South London Tramways.—The tramway from Brixton to the Westminster-road, the present terminus being at the corner of Hercules Buildings, opposite to the Female Orphan Asylum, has been opened for public traffic; the carriages, which will hold forty-six persons inside and out, and be drawn by two horses, running every five minutes. If the tramway fare is to be kept at 2d. for the above distance of a mile, the omnibuses will not have any reason to fear the competition.

The Fungus Show at the Royal Horticultural Society, on the 5th inst., proved very attractive. Notwithstanding the drought, a great many fine and curious specimens were exhibited; and as there was no collection in the first class, which was confined to edible fungi, the prizes were awarded to Mr. G. Worthington Smith and Mr. James English, whose collections were considered of equal merit, while the second prize was given to Mr. Hoyle.

TENDERS.

For laying out land at Worthing. Mr. Alexander Peebles, architect:—

Carrington	£4,550 0 0!
Peacock	2,762 17 8
Carter	1,830 0 0
Dyne	1,600 0 0
Blaker	1,498 0 0
Haynes	1,449 0 0
Blackmore	1,449 0 0
Hubbard	1,439 0 0
Pizzey	1,400 0 0
Cole	1,334 0 0
Vickers & Crane	1,316 0 0
Clarke	1,177 0 0!

For farm buildings, Ramsbury, Wilts, for Mr. C. Lanfear. Mr. Jas. H. Money, architect:—

Cruse	£1,175 17 0
Dyer	1,045 0 0
Simonds	975 0 0

For farm homestead, Standen Farm, Wilts, for Mrs. General Dunn. Mr. Jas. H. Money, architect:—

Dyer	£2,666 0 0
Wooldridge	2,196 0 0

For the erection of new entrance-lodge to Hughenden Park, Bucks, for the Right Hon. B. Disraeli, M.P. Mr. Arthur Vernon, architect:—

Loosley	£410 0 0
Nightingale	385 0 0
Corby	381 0 0
Spicer	375 0 0
Reavell	345 0 0
Woodbridge	340 0 0
Almond	330 0 0
Nash	316 0 0
Cooper (accepted)	298 10 0
Johnson	270 18 6

For Primitive Methodist Chapel, Lincoln-street, Hull. Mr. Musgrave, architect:—

Clarkson	£2,734 0 0
Skinner	2,694 0 0
Jackson	2,600 0 0
N. & J. Hall	2,440 0 0
Musgrave	2,400 0 0
Robinson (accepted)	2,380 0 0
Sergeant (too late)	2,360 0 0

For the erection of a dwelling-house and stable, for Mr. George Allen, in Victoria-road, Romford. Mr. E. C. Allam, architect. Quantities supplied:—

Gordon	£657 0 0
Hinds	558 0 0
Davey	556 0 0
White (accepted)	537 0 0

For the erection of a minister's house, for the Congregational Church, in the Western-road, Romford. Mr. E. C. Allam, architect. Quantities supplied:—

White	£776 0 0
Nightingale	676 0 0
Hamlin	644 0 0
Wright	623 0 0
Hinds	617 10 0
Reed	597 0 0
Poulson	587 0 0
Blease	586 0 0
Holmes	585 0 0
Warr	580 0 0
Davey (accepted)	559 10 0
Death	558 2 6

For the erection of a dispensary, relief offices, workrooms, &c., at Notting-hill, for the Kensington Board of Guardians. Messrs. James Broadbridge & Josiah Houle, architects:—

Lot, Brass, & Son	£10,289 0 0
R. & T. Pargetter	9,860 0 0
Saul	9,398 0 0
Markwick & Thurgood	9,288 0 0
J. & S. Williams	9,259 0 0
Crockett	9,190 0 0
J. & A. Wright	9,160 0 0
Chappell	9,091 0 0
Wigmore	8,985 14 6
Henshaw	8,975 0 0
Scrivener & White	8,889 0 0
Langmead & Way	8,800 0 0
Cowland	8,775 0 0
Temple & Foster	8,745 0 0
Hill, Keddell, & Waldram	8,580 0 0
Hockley	8,397 0 0
Foster	8,268 0 0

For New Congregational Church, Reading. Messrs. W. & J. T. Brown, architects:—

Contract No. 1.—*Schools.*

Sheppard	£885 0 0
Wheeler Bros.	850 0 0
Grover	836 0 0
Woodruffe	800 0 0
Barnicoat	765 10 0
Matthews (accepted)	757 0 0

TO CORRESPONDENTS.

T. C.—P. P.—L. & N.—F. M.—J. L. P.—A. P.—C. S. B.—W. M.—H. H. S.—Capt. G.—H. G. R.—H. A.—J. M.—A. V.—J. B.—J. C.—Dr. Z.—T. P.—M. R.—A. B.—S. M.—Bailey.—Dr. D.—E.—Mr. T.—G. P.—H. P.—Messrs. F.—C. B.—J. H.—E. C. A.—Messrs. B.—R. T. S.

The Builder.

VOL. XXVIII.—No. 1446.

Sewage Irrigation.

SEWAGE IRRIGATION is progressing. The Vice-Chancellor is the great incentive. Town sewage pollutes a stream so as to cause nuisance injurious to trade, to occupation, or to health. The Court is applied to, and almost as a matter of course, the required injunction is granted. The town authorities then look about for means of escape. Something must be done to abate the nuisance. Chemical treatment has been tried on sewage at town after town, but only to prove a failure, and irrigation has to be resorted to. Chemistry has broken down at Leamington, at Cheltenham, at Coventry, at Northampton, at Halifax, and, indeed, at most other places where precipitation by chemicals has been tried; the singular feature in the case being that chemical treatment of town sewage, for the purposes of obtaining commercially paying results, and rendering the effluent water pure, has never been advocated by any chemist of reputation. Patents have been taken out by adventurers, and by honest enthusiasts, just as patents are taken out for many other impossible purposes,—perpetual motion, for instance;—and, no doubt, other persons will take out patents for similar purposes. Select committees at times receive very curious evidence on many questions,—all on oath. This in itself is a curious fact. Men of repute swear to the truth of their statements. A swears black is white; B swears that black is green, or something quite as contrary, and about which there ought not to be any difference, because demonstration proves that white is white and black is black, and not green. A civil engineer, a well-known chemist, and a Professor swore last session that chemical treatment of town sewage is the true remedy, and that irrigation will swamp land, poison vegetation, produce malaria, generate hydatids (tape-worms, &c.), and that, to sum up, the results of irrigation will be sickness and death in most horrible forms. The reply is, irrigation is as old as civilisation. Sewage application to land (at Edinburgh) has gone on over some parts of the existing sewage-farm two centuries, and over the greater portion from sixty to thirty years. The sewage is black and stinking before it reaches the land. The carriers are large open ditches very foul, and volumes of this putrid sewage in excess are flooded on to the surface without due care to prevent nuisance. Official and other inquiry has, however, shown that local disease has not been caused by emanations from this sewage-farm. Cows are stall-fed on the grass so grown; and the milk and the butter are both wholesome and abundant. In the hospitals of Edinburgh, no case of entozoa taint (though looked for) attributable to the sewage-farm has been recorded. What difference can there be betwixt solid town manure and liquid (sewage) manure? If there is danger in using liquid, there is similar danger in using solid manure; as, if there be the ova of tape-worm in one, there will be in the other. But this bugbear may be discarded. Sewage-farms will soon be as "plentiful as blackberries," and, if people will only inspect those at Bedford and at Romford, they will see the crops of cabbages, mangolds, carrots, turnips, and other garden produce are as fine as the prize specimens of the best agriculturists. But besides being fine (large), the vegetables are good—so much better in flavour than vegetables as ordinarily grown that they might be new specimens of a newer and finer sort. The money produce of an acre of sewage-farm varies from 25*l.* to 75*l.* for crops of four and six months' growth. Sewage farming is beneficial in several ways, as the land produces from ten to twenty times more produce, of a better quality, and finds profitable employment for ten times the number of men on the land. The sewage of London, now wasted, and horribly polluting the Thames at Barking and Crossness, might be applied in irrigation over 30,000 acres of land on the margins of the river betwixt London and the sea, increasing the annual produce up to an equivalent of that obtainable now from 300,000 acres, under ordinary farming, employing ten times as much labour, and producing milk, butter, and cheap market-garden vegetables of the finest sort, better than any now to be obtained at Covent Garden at any price. If Government aided the metropolitan parishes to purchase the requisite 30,000 acres of land, and laid it out for sewage irrigation by rooting up useless fences, levelling, deep draining, forming conduits and carriers, making roads and tramways, there need not be one able-bodied pauper on the relief-books of any London parish; as any willing man can perform farm labour if fit to work at any occupation; and the work may be "piece-work;" not mere "task-work," but, as during the cotton famine, with distressed cotton operatives, "work for wages." Sewage-farm work would not be so complicated or so difficult as executing town improvements, such as sewering, draining, forming streets, paving, and such work. The increase of pauperism in London is alarming, and the present course of Poor-law legislation is calculated to increase it. Improved workhouses and hospitals, vagrant wards, out-door relief and medical relief (though at present not to be done without), will draw up to the metropolis every tramp who can walk or find means to ride so far, until, wealthy as London is, the poor-rates will become intolerable. But the money cost will be the least evil. There will be such a mass of demoralisation as will become turbulent and unmanageable. Neglected poverty will avenge itself on the rest of the community. No people ever staved off rebellion by subsidising idle men; no nation ever saved itself from subjugation and ruin by purchasing the forbearance of surrounding barbarism; and if statesmanship cannot find a safer remedy for the growing want and misery in England without relying on the present form of Poor-Law legislation, the poor will overwhelm the rich, or deprive riches of their supposed contingent comfort. Trade-unions, Chartism, Fenianism, socialism, and infidelity thrive under purblind legislators. There may be ways to govern men so as to secure health, morality, comfort, and peace at home. But a compact with idleness, by any form of law (Poor-law), as amended, will not lessen vagrancy and pauperism.

What has town sewage irrigation to do with this question? may be asked. Well, the reply is, a population of 12,000,000 living in towns produce sewage which pollutes the streams and rivers, but if applied to land, in irrigation, would increase the food produce of 200,000 acres to an equivalent of 2,000,000 acres, and would also find employment for ten times as many men as are now working on the comparatively unproductive 200,000 acres. A a nation, we waste our wealth in many ways to produce nuisances; as in the sewage of towns, and in so-called "waste products of manufactures," chemistry shows that there is no waste product, if it is only treated as science indicates, and is put to its proper uses.

STRAY NOTES IN LANCASTER.

THE first impression produced on the visitor to the county town of Lancashire is not very inviting, nor giving any great promise of interest either architectural or picturesque, unless narrow, irregular, devious streets, and various eccentricities of level and incline, may be held to constitute somewhat of the latter element. The houses that line the streets are mostly deficient in picturesque or architectural effect, to an extent unusual in a town built on such an ancient site and with such a long history behind it as Lancaster: what there may once have been in the way of domestic architecture having been evidently demolished, and rebuilt in the true builder's style of the eighteenth and nineteenth centuries. A feature, however, peculiar to the district is to be noted, in the shape of an unusual style of doorway of the earlier part of the seventeenth century, specimens of which are in preservation here and there, and which appear like the last echoes of the faded Mediæval style. One of these is to be seen in Bridge-row, a steep, narrow, crooked lane, said to have been formerly the chief street of the town: the jamb mouldings of the doorway consist of a half-roll, a hollow, and a wave moulding, the whole resembling what one would generally accept as a late Rectilinear moulding; the form of the lintel (for it is not really an arch) is what would be a very flat ogee, but for a drop about 1 ft. square in the centre, terminating in a double wave on the soffit; the whole of the jamb mouldings (about 14 in. girth), are mitred right round, following the outline of the door head. It is an odd-looking feature, and might be a puzzle as to the date, which, however, is cut on the square drop-stone mentioned, and fixes it to the early portion of the seventeenth century.* Lancaster is not, however, deficient in special objects of architectural interest, however uninviting in its general aspect. The parish church, which stands at the highest part of the town, close to the castle, is a large building of very late Gothic date, lately restored internally by Mr. Paley, and presenting now a good and satisfactory interior with an expression of solidity without heaviness. The point of attraction, however, in the church, is the carved oak reredos, so used and styled now, but which is in fact of older date than any portion of the church, and possibly was brought from one of the dismantled north English abbeys, perhaps Furness. Whatever its origin, it is unquestionably one of the finest specimens of carved woodwork in England, as we have before now pointed out, and in itself well worth going out of the way to look at. There are eighteen divisions or bays, consisting of open tracery canopies, with pinnacles between, standing partly against the wall under the east window, and partly in two returns coming up to the altar-rail on the north and south aisles; the returns having also stalls with folding *miserere* seats. The tracery in each compartment is different in design, of late Decorated style, and showing some most curious combinations of form, and each canopy shows deep flat crocketing and finials of wonderful richness and elaboration of design, all varying throughout; the cusping of the ogee arches on the lower portion of each canopy is terminated on each cusp by a small head, not much more that 1 in. in diameter, carved with the minutest delicacy; and the mouldings of the canopies and sub-arches are hollowed and undercut to a depth usually found only in stone-moulding. Altogether this is a remarkable work, and especially so for the characteristic and thoroughly *wooden* treatment of the carved foliage. A large and in many respects fine organ, of the old school, and not in the best repair, occupies the west gallery (a pre-restoration feature); this it is now proposed to bring down into the church to get it nearer the choir at the east end. Let us hope that the church authorities do not meditate burying the instrument alive in an organ-chamber alongside of the

* 1629, if we remember rightly; a heavy rain at the time was unpropitious to making written notes.

chancel, in the manner we have more than once protested against; its best position would be against the north side of the nave, to meet all demands. An offensively violent east window, by Wailes, of the "gorjus" type recently described by a well-known correspondent, exhibits all the colours of the rainbow on the strongest possible scale; while a foil to this is exhibited in a perfectly harmless window of Messrs. Clayton & Bell, in the south aisle, which at all events steers clear of the sin of "polychromy," showing little but a variation of tertiary browns. The close contiguity of those two windows furnishes the most striking instance we have seen of the utter absurdity of permitting the unrestricted indulgence of individual taste in stained glass in the same edifice. There might be arguments adduced in favour of the tone and style of either of the two windows mentioned, taken separately; but that the same building should be lighted through windows designed in a totally different scale of colour, is ridiculous. The stained windows of a church, if not all by the same maker, should at least be designed with reference to each other and to the building, and be under the supervision either of the architect or of some competent designer, who should have the ordering of the whole, so as to produce at least some approximation to chromatic harmony and unity of effect. Externally the church shows little for remark, but the view from the churchyard, flanked by the heavy square masses of the castle, is very fine; on one side, towards Morecambe Bay and the Westmoreland hills, and in the other direction across the lower portion of the town to the rising ground on the outskirts, against which the fine tower and spire of the Roman Catholic church rises, light against the hill and dark against the sky beyond. The general aspect of the too-famous castle is pretty well known; the entrance-gateway contains some transitional work in the way of groining and corbels, and in the large courtyard is a circular arch, in the wall of part of the building, said to be Roman, but which has certainly been cleaned and reset, from the appearance of the stone, and is, therefore, somewhat apocryphal. The main portion of the castle is the restoration or rebuilding of the late Mr. Harrison, of Chester, restorer also of Chester Castle: his work is neat and well executed, but decidedly tame in comparison with the best of the older portions. Descending the hill, we shall find the Roman Catholic church before mentioned worth looking at, as a capital specimen of good, sober, modern Gothic work, not showing anything very new in the treatment, but a very successful example of what it was probably intended to be, a reproduction of genuine Mediæval art. It is built of a fine, hard, light-coloured stone of the district, very pleasing in tint, and looking as if it would stand well. The lofty spire is a particularly fine one, all the more satisfactory in effect from the decided and almost visible *entasis* in the lines, which gives it a full, plump, and well-nourished appearance that would be felt even by those who do not know how it is produced. Internally the difficulty of producing a three-aisled church which shall be convenient for worshippers has been well met by the employment of comparatively slight piers and a wide arcade; and there are some monuments and shrines in the church showing carving and bas-reliefs (chiefly alabaster) of considerable merit, though in some cases rather overdone in the decorative carving, a remark which may apply also to the nave capitals, which are somewhat too exuberant in style, though not more so than is commonly the fashion of modern Gothic carving. The church is from the designs of Mr. Paley (now the firm of Paley & Austin); and that the Lancastrians appreciate their principal resident architects is implied by the fact that all the new buildings of any consequence in the town are from the same hand. What are we to say, however, to the eclecticism which will build barracks in the Scottish Gothic style, or a semblance thereof, and a bank in the Italian or quasi-Classic style? There seems to be a current impression among bankers that the exigencies of their business imperatively demand Classic "fronts;" it is probably to this that we are to set down this aberration of a Gothic firm from the path of their predilections; but these little sins carry their own retribution, for the new bank in Lancaster will scarcely rank, in external aspect at least, as the happiest of its architect's inspirations. Those who have given their sympathy and habits of design to one style do not readily succeed equally well in another; or are we, perhaps, to regard the tame aspect of the Lancaster Bank as a little bit of wickedness on the part of its Gothicising architects, making a sly point in favour of their favourite style by the erection of a feeble Classic building as a foil to others in an opposite style? We have heard of such things before now. Practically, the new bank seems likely to answer all its purposes well in the internal provisions of plan, vault accommodation, &c.; not to mention the *marbled* iron columns, the well-known insignia of a bank interior. But Messrs. Paley & Austin will certainly do themselves more credit, in the eyes of architects at least, by their large asylum (a kind of provincial Earlswood) half of which (the centre and one wing) is now nearly completed. The building stands on a most effective site on a rising ground in the outskirts of the town; it will be, when complete, a parallelogram with projecting wings and centre, the centre marked by what may be termed a tower, with a high pyramidal roof, of very picturesque but not eccentric outline; the portion of the wall immediately beneath the eaves is left as an open arcade with a row of pointed arches; we presume it is to be used as a promenade or prospect tower. The whole building is, we must say, one of the most satisfactory examples we have seen of architectural expression attained by a simple and unpretentious breadth of treatment; by character in the masonry, which is exceedingly good, of the same light stone (we believe) as the Roman Catholic church, and relieved by a very few bands of a darker red stone; and by ornament sparing but well chosen, and of dignified character. This may be described as mainly of Early Gothic character; among other features the inverted volute of the transitional period appears with good effect in the caps of the shafts in the centre doorway and elsewhere. At the back is a separate block of building, reached by a covered way, for washing and drying rooms, &c. The principal internal feature is the large dining-hall, roofed with a timber roof of laminated ribs. The rest of the interior presents no special feature of interest, as the institution is not yet in operation. The kitchen is a large airy apartment, supplied with cooking stoves and ranges, by Messrs. Bennett, of Liverpool. The work, as we said, is incomplete so far, one wing having been finished first, for the more speedy reception of inmates. The second wing is now commenced, and when the whole is completed, the architects may, we think, be congratulated on having produced a building which, without any undue expenditure on purely architectural features, will have a fine and picturesque outline from a distance, and will show on a near inspection that solid and durable expression obtained from characteristic masonic treatment, rather than from applied ornament, which belongs to work done in a true architectural spirit. In these respects this asylum forms a contrast to the more pretentious building of the same nature on a neighbouring site, the Ripley Hospital, by a Liverpool architect, which, in general treatment, is certainly not to be commended or admired as an example of architectural design.

A pleasant suburb it is that rises from the town on the hill opposite the asylum, where some quiet home-like residences, built of the light-tinted stone of the district before mentioned overlook an undulating landscape, not without its points of interest and beauty. Lower down we may notice rows of the regulation English middle-class dwellings, with not only the inevitable bay-windows all in a row, but a characteristic shrub of the cactus species in the centre of each small garden, as if this, too, were a part of the design; thus carrying out the principle of uniformity a degree further even than is usual in this class of house. From the high ground in the suburbs we may notice, too, that here, as often elsewhere, distance lends enchantment to the view; and that Lancaster, dull as its streets may be, appears from a distance as a most picturesque town, with its undulating outline crowned by the castle and the church tower. It is satisfactory, also, to learn that Lancaster is no longer under the reproach which once attached to it, of being one of the dirtiest and worst-drained of towns. Under due pressure brought to bear by some of the more enlightened inhabitants, drainage has been carried out effectively, if we may judge by the results. Whether the political morality of the town, which suffered so much in public opinion some time since, has undergone any analogous process of purification, we did not learn; and, perhaps, the question does not rightly come within our limits. Remembering, however, that the removal of material dirt is, as we are now beginning to see, an important step towards the process known as "cleansing the moral atmosphere," we may take leave of Lancaster in a hopeful spirit.

A RUDIMENTARY MANUAL OF ARCHITECTURE.*

A small volume, published under the above title,* furnishes one more indication that the study of architecture is beginning by slow degrees to be recognised as one worthy the attention of those who wish to be, and to be thought, educated people; if, as we suppose, the fact of a supply indicates the previous existence of a demand. Most of the recent books written specially for the use and instruction of amateur students of architecture have so far resembled each other, that they have been the work of amateurs, and that they have given an overwhelming preponderance in their considerations to one style, and to one variety of that style, viz., English Gothic. As far as regards the object of making the public acquainted with the principles of architecture, both these conditions are unfortunate. Architecture is, of all arts, the one which presents most stumbling-blocks to dilettantism, because it is the one art which is based on practical necessities, and it is, more than any other, inseparably blended with constructive conditions, which must be understood and appreciated before the merits of a style or of a design can be properly criticised. And the overweight given by modern (especially clerical) amateur writers to one style is a fatal mistake, unless the avowed object be merely to give a history of that style, and to recommend it as the only one worth following. What general readers really require, in regard to a subject which they are not expected to fully go into, is to have the leading principles which form the basis of the subject clearly laid down and defined, and to have such a broad general view given to them as will enable them afterwards to attach the true degree of importance to details which may subsequently come under their notice. Instead of this, the public are presented, in handbooks and lectures, with a quantity of isolated facts about this and that style of architecture, with little attempt to discriminate as to right and wrong principles of architectural design, and the deficiency is made up for by a great deal of eloquence and rhetorical declamation on the emotions you are supposed to feel on entering a Gothic building; all very well in its way, but, as Hamlet says, "Something too much of this."

It may be replied, and very likely with perfect truth, that this sort of writing about architecture is all that the general public care about; they want to be amused, not instructed. Nevertheless, we cannot but regret that the author of the well-got-up and pleasantly-written little book before us has not been able to steer more clear of the defects of other amateur writers on the same subject. On the rhetorical charge, indeed, we can acquit him personally; his flights of rhetoric occur only in the shape of quotations from reviews and magazines. And it would be very unfair to Mr. Mitchell to say that he does not recognise the existence and appreciate the value of leading principles in design; but he has not made them sufficiently the basis of his book; various isolated remarks would lead us to conclude that he has a clearer perception on this head than he has been able to convey to his readers. The definition given of architecture, as "the art of constructing buildings upon correct and scientific principles, in which strength, utility, and beauty are combined," if somewhat vague, is, at all events, broad enough; and we cannot be too often reminded that "good architecture is always truthful, *i.e.*, it will always be what it seems to be, both in construction and material;" but the statement that "architecture is *the noblest of the arts*, as pressing all other arts into its service, for those of the painter and sculptor occupy but a subordinate part in producing the general result," is a somewhat amusing *non sequitur*, involving also the total ignoring of poetry and music as among "the arts." Writers on art, however, have long enjoyed a tacit privilege of each praising his own

* A Rudimentary Manual of Architecture; being a History and Explanation of the principal Styles of European Architecture—Ancient, Mediæval, and Renaissance, with their chief Variations described and illustrated; to which is appended a Glossary of Technical Terms. By Thomas Mitchell, author of "The Stepping-Stone to Architecture." London: Longmans, Green, & Co.

particular art as "the noblest." But our author, whatever his own perceptions may be, does not succeed in bringing them to bear on the elucidation of some of the most important parts of his subject. He observes with truth, at the head of his chapter on Greek architecture, that "the term *classic* as applied to any one style of architecture is fallacious. No such style exists, but two styles are ordinarily included under that term, viz., the ancient Greek and Roman;" but he fails to discriminate the vast distinction of principle and feeling which separates what is usually called Classic from Gothic art, the fundamentally diverse end and method of treatment which distinguish the two schools of art;* and, with regard to architecture, the remarkable distinction between the *scale* of Greek and Gothic architecture; the one preserving always the same relative proportion of parts, so that a large building is only a small one magnified, the other preserving nearly the same actual scale of detail in large and small buildings, and multiplying parts instead of enlarging them. The system of subordination of parts in Gothic architecture is recognised *en passant*, but so important a principle might well have received special illustration. The remark is made (p. 170) that the sculpture of the "Decorated" period in English architecture "loses much of the stiff conventional character and severity of the Early English style, and more closely imitates natural flowers and foliage;" but the author fails to see that this question of conventional *versus* natural forms in ornamentation is at the very root of the whole principle of architectural ornament, and instead of being mentioned as an incidental matter might have claimed a separate chapter for its elucidation, even, or we should rather say especially, in a "rudimentary" work. And how far the author is *au fait* in regard to construction, the basis of architecture, we may conjecture from the description given of a tie-beam roof (p. 177), where we are told that "the king-post stands upon the tie-beam, and extends up to the ridge-piece or apex of the roof, *which it supports*."

The fact is exactly the reverse, Mr. Mitchell. The king-post *hangs* from the junction of the principal rafters, and supports the centre of the tie-beam, to prevent it "sagging," and thus to gain stiffness for the roof, without the waste of weight and material which would be caused by a tie-beam sufficiently thick to stand without such support. The head of the king-post certainly receives the ridge, because it makes a convenient "seat" for it, but the rafters support it, and the king-post itself is in a state of tension, not of compression. This may be thought a small mistake; but no one who understood anything of construction would have made it. *Ne sutor ultra crepidam: i. e.*, amateur architects should not take on them to expound construction.

We are constrained thus plainly to point out the deficiencies of the book, since its author tells us in the preface that in it "he has endeavoured to supply a want that has long been felt in the preparation of a text-book for the preliminary education of the student." We must beg leave to say that his book is not by any means fitted to take such a place, and that a far better text-book already exists (though very badly illustrated) in Mr. Garbett's small treatise on the "Principles of Design in Architecture," which Mr. Mitchell does *not* include in the list of works to which he is indebted, though he might have learned a good deal from it. Taking the book, however, simply as a readable *résumé* of the leading styles of architecture for the use of amateurs, there is a great deal to praise in it. It is well written, in point of style, throughout (not, we are sorry to say, a common characteristic of architectural works). The author devotes a short chapter to the early history of architecture, rather suggestive than historical, however; and then gives, in separate chapters, a sketch of the Greek, Roman, Byzantine, Romanesque, and Mediæval styles; the latter occupying by far the larger portion of the book. What he states as to the facts and characteristics of each style is, in the main, quite correct; and some of his occasional criticisms are good and well introduced; in particular, the remark on the radical difference between the Romanesque and the round-arched Gothic, the former consisting of a succession of horizontal stories nearly independent of each other in design, the latter showing the first symptoms of the sway of the vertical line over the horizontal; and the comments also on the ill-judged combination of architrave and arch in the Roman style: indeed, it is surprising that a writer who expresses himself with so much judgment on some points in connexion with his subject should have failed so much with regard to others.

We do not believe the statement, repeated once more by our author, that many of the finest of the Greek temples were unroofed and open to the sky; the Greeks were incapable of anything so thoroughly illogical and inartistic; nor is the theory of the "wooden origin" any more applicable to Greek architecture than to several other styles; the connexion is by no means so close, we imagine, between the timber and the masonic features as has been supposed by some writers. But in the main the chapters on Greek and Roman architecture give a fair outline of their respective characteristics, as also the chapter on the Byzantine style, in which the connexion of the architectural with the national and religious influences of the period is sufficiently indicated. Mediæval architecture is more fully treated of, in four or five chapters and with tolerably copious and well-selected illustrations; the description involving pretty nearly what may be read in most manuals of Gothic architecture, without any specially new observations: but the important subject of the Gothic vault, so remarkable in its development and in its constructive influence on the style, receives by no means adequate attention or illustration, and is described in very "amateur" language,—*ex gr.*, that "the joints or seams where the arches intersect are mostly covered by a moulded rib." Now, in all but the later and most ornate traceried vaulting, the ribs form an integral portion of the construction, being in fact the framework of the whole roof, with interspaces arched in lighter and thinner stonework (or occasionally in chalk); Mr. Mitchell speaks as if the rib were applied on the surface like a modern joiner's moulding. In selecting Warmington Church as an illustration of the Gothic spire, he has made a happy choice, though the engraving is rather too small; but there could not be a finer example of the best and most characteristic style of Early English spire. The east window of Merton Chapel, Oxford, is not so felicitous an example of the geometrical window tracery; a better one might well have been found,—as to design, at least.

The author very rightly gives due place and recognition to the Renaissance, which many recent writers (especially amateurs) have ignored altogether, as if it were not as distinct and marked a phase in the art as any other, and therefore historically interesting at least, despite its radical defects. The chapters on modern architecture, indeed, are about the best in the book.

As to the question of the style for the present day, we may observe that there are more force and truth in the remarks of one or two writers of the anti-Gothic party, whom Mr. Mitchell quotes with reprobation, than he is ready to admit; and that certain criticisms of Mr. Fergusson's, of which only a part and not the whole is quoted, were not too strong for the buildings against which they were specially directed; and that writer certainly never said anywhere that Gothic detail "must necessarily be poor." Mr. Mitchell, in short, like most of the amateurs at present, is a "Gothiciser," to which we should have no objection whatever, if he would give rather better reasons for his faith. His suggestion of a Gothic employment of domed forms as a point of departure, though not new, is well repeated.

To the book is appended a short glossary of architectural terms, which will be of use to readers; and though, for reasons aforesaid, we cannot allow the book a standing as a text-book suitable for students, as its author seems to regard it, we can say with truth that the majority of persons who may read it will know more about architecture when they have finished it than they do at present, and that they will find it very easy and pleasant reading. The illustrations are well got up, and mostly well-selected.

We are sorry to have to qualify our praise of the writer for his work; but there has been too much of loose dilettanti writing on architecture; and a small book on a great theme should only be attempted by those who have thoroughly mastered the subject.

* On this head the reader may refer to a paper in the *Builder* for March 20, 1869, under the title "What is Classic?"

THE STONE PERIOD: EARLY MAN.*

In anticipation of a visit to the Blackmore Museum in Salisbury, I have been asked to speak of the stone implements and other objects of which the collection consists. This collection is chiefly remarkable for the admirable manner in which it enables us to study the simple arts which prevailed, in various countries and at different times, in what is known as the Stone Period. Much misunderstanding appears to prevail as to what is meant by the "Stone Period," and it may be well to deal with this question at the very outset. Some tribes of men are, at the present day, living in their Stone Period; others have but recently emerged from it; whilst we learn from the discovery of certain chipped flints and rubbed stone hatchets that tribes, of whom history tells us absolutely nothing, existed in their Stone Period in regions where a far higher state of culture is historically known to have prevailed for centuries. The Stone Period, therefore, affords us no measure of time, not at least of time *positive;* it exists to-day, existed yesterday, or thousands of years since; the Stone Period, however, is of great value as a test of human culture. It represents to us a culture stage in which man was, and is, fain to supply his needs by means of implements and weapons formed from natural substances, such as wood, stone, shell, bone, horn, and the teeth and claws of animals. During this period some tribes made use of the native copper or meteoric iron which they collected, but these masses were merely hammered into shape: they were treated only as malleable varieties of stone, and were not melted and cast into the required forms.

There is evidence of the existence, in some countries, of a Copper Period, during which native copper was melted and cast into tools and weapons. But a great advance was made upon the use of unalloyed copper, when it was discovered that an admixture of tin imparted a hardness to this comparatively soft and ductile metal. It is highly probable that many copper implements were re-cast during the Bronze Period, with the addition of tin, and that the comparative scarcity of ancient copper tools is, in part, due to this circumstance.

Then there is the Iron Period, during which the art of reducing iron from its ores was discovered, and this metal superseded the use of both stone and bronze for cutting instruments and for many other purposes. It is probable that no absolute uniformity has prevailed with regard to the sequence of these culture-stages; in some countries the Stone Period may have lingered on much longer than in others, and in some countries perhaps neither a Copper nor Bronze Period may have existed. But in *every* country there appears to have been a Stone Period, although it by no means follows that the ancestors of the present occupants of the soil were the stone-using people. Indeed, in dealing with these culture periods, no general rules can be applied to the remains found in various countries and districts; each series of facts has to be separately and cautiously investigated before we can venture to pronounce an opinion upon it.

It is natural that every young science should have to pass through a stage in which its teachings are misunderstood, and, not unfrequently, are misrepresented. Pre-historic Archæology appears to be still in this phase of its existence, and, in particular, these typical stages of human culture,—the Stone Period, the Bronze Period, and the Iron Period,—have provoked the criticism of some who have, and many who have not, made themselves sufficiently acquainted with the published views of archæologists upon the subject. For instance, in an article which has recently appeared in the *Quarterly Review*, under the title of "Non-Historic Times," allusion is thus made to the classification of Pre-historic remains by the Danish antiquaries:—"First came an age when the country was inhabited by savages, ignorant of the use of metals, and only employing stone and bone for all the purposes for which tools are necessary." So far well; but then follows:—"And as a corollary to this, every monument which contained no metal, or in which any flint implements were found, was at once relegated to those remote ages." The writer then adds:—"There was a delightful simplicity about this system that made it instantly popular. Every one could distin-

* By Mr. E. T. Stevens, read at the recent Congress of the Wiltshire Archæological Society.

guish between stone, bronze, and iron implements; and as this was all the knowledge required to determine the relative age of any 'find,' or of any monuments, it was universally adopted."* Now, although these passages form strictly a criticism of the Danish system of classification, yet many readers of the article would be led to suppose that they really express the present views of archæologists, or at all events of Sir John Lubbock, whose work, "Pre-Historic Times," is the first upon the list which heads this article, and is supposed to be, although it actually is not, reviewed by the writer of "Non-Historic Times." But, in order to prove that Sir John Lubbock does not hold these opinions, it is only necessary to turn to the third page of "Pre-historic Times," where we find this passage:—"Stone weapons of many kinds were still in use during the age of bronze, and even during that of iron; so that the mere presence of a few stone implements is not in itself sufficient evidence that any given 'find' belongs to the stone age."† Had this passage been written, purposely, in refutation of the views ascribed to archæologists by the writer of the *Quarterly Review* article, the wording could scarcely have been more precise and to the point; and yet this passage was in print five years before the article in question was published, and in a book which is supposed to be reviewed in this very article. If, therefore, the passages I have cited from "Non-historic Times" are not wanton perversions of Sir John Lubbock's views, it is clear that the reviewer either did not read or did not read aright the book he professed to review. And yet statements such as these are frequently allowed to pass unchallenged, and become articles of faith with such as are either too indolent, or too careless to examine into the subjects for themselves.

The writer of "Non-historic Times" notwithstanding, the stone, bronze, and iron periods *do* afford us valuable tests of human culture, although they are, even at best, no more than rough tests; for, whether in ancient or in modern times, it will be found that the development of civilisation has not been at all uniform in operation.

The Stone Period is usually a period of savagery; the Bronze, of barbarism or low civilisation; and the Iron Period, that of the middle level of civilisation and onwards. This ideal scale, however, requires much qualification. For instance, we know of no savages above the culture level of the Maoris, Caribs, and Cherokees who have lived in the Stone Period during historical times. But it was not invariably so in pre-historic times, for the Swiss lake-dwellers, during their Stone Period, led a settled life, were a pastoral and agricultural people, and attained a condition to be regarded as barbarian rather than savage. Perhaps of the three, the Bronze Period affords us the most safe and reliable test of culture. The typical bronze-using races of modern history are the Mexicans and the Peruvians, and what is known of them agrees well with our dim information of the pre-historic bronze people of Europe and Asia, so as to justify the opinion that bronze always indicates a state above savagery, though at most extending to the middle range of civilisation. It is interesting to find that the bronze-using Mexicans largely employed stone implements for cutting purposes, and no weapon appears to have been more dreaded by the Spanish invaders than the Mexican wooden sword armed at the edges with flakes of obsidian. We have thus in the case of the ancient Mexicans very clear evidence of the contemporary use of bronze and stone implements.

The Iron Period is wanting in the definitiveness of the two other periods. Iron is, indeed, the universal accompaniment of the higher civilisation, but it also descends into the savage state. Modern iron-using people of Asia range from Persians, Hindus, and Chinese, down to the barbarous Kalmuks and Khirgis, and the savage Ostyaks; while, in Africa, the Kaffir and Hottentot tribes, though ironworkers, are in general culture below the ironless Mexicans and Peruvians. It is evident, therefore, that the diffusion, or the independent discovery, as the case may be, of the art of iron-working has, in some instances, taken place without a corresponding elevation in civilisation. Indeed, the iron-using Malay, Tartar, and African tribes in their ideas of ornamentation, the forms of their weapons, and in some other respects, present striking analogies to the pre-historic bronze-using people of Europe.*

Imperfect, however, as the Stone, Bronze, and Iron Periods may be as tests of culture, they contrast in this respect very favourably when examined side by side with the other industrial arts. For instance, it might be imagined that the art of making pottery would furnish us with one of the very best tests of culture; but, at the outset we find that certain of the lower savages, such as the Australians, Fuegians, and Bushmen, when first observed by Europeans, did not make pottery, and were absolutely ignorant of its use. Some pre-historic races also appear to have been unacquainted with the art of making pottery. None has been found associated with the flint implements of the Drift; and scarcely any, if any, which can be assigned with certainty to the period of the cave-dwellers of Dordogne and the South of France. Nevertheless, speaking generally, knowledge or ignorance of the potter's art affords a fair low-level test of races, separating the lower savage from the upper savage; but that this rule is not universally applicable is shown from the fact that the Tahitians and New Zealanders did not make pottery, while the much lower Papuans of New Caledonia and the Fijians were potters.

Having thus explained my views to you of what I believe the Stone Period to be, you will at once be in possession of the key to the system adopted in the arrangement of the Blackmore Collection. In that collection you will find the specimens classed partly as tests of culture, partly according to the country in which they were found. For instance, the stone implements found in France, in the drift, the caves, and upon the surface soil, are each arranged in a separate group, because each series is believed to represent a distinct stage of culture; in such cases the classification by country, in the Blackmore Collection, ceases to be a primary, and becomes only a secondary sub-division.

In a National Ethnographical Museum, such as the Christy Collection, a general system of classification by country may, perhaps, be adopted with advantage. But in the Blackmore Collection, the chief object of which is to illustrate the simple arts of the Stone Period, and to enable students to study them as tests of human culture, in this comparatively limited field of inquiry, I believe that our system is the most simple, and the most intelligible which can be adopted.

We do not class our specimens according to material; all objects, no matter of what material, if found associated with each other or met with under circumstances that justify the belief that they were in contemporary use by the same people, are arranged together; and although a few stone implements of the Bronze and Iron Periods are placed in the same cases with some which belong to the Stone Period, they are placed there only for purposes of comparison and illustration, not because they happen to be of a similar material. The collection formed by Messrs. Squire & Davis, when it reached this country, was classed and catalogued strictly according to material; consequently a group of objects found in a single tumulus, if one was of pottery, another of stone, a third of bone, and a fourth of shell, would have been divided from each other and placed in four different cases, although collectively they serve to illustrate but one incident in the customs of a particular people. These specimens are now arranged, as far as possible, in distinct groups according to the tumulus in which they were respectively found, and without any reference to the material of which they are composed.

By limiting our collection to objects illustrative of one branch only of a vast subject, there is less to distract the mind, visitors are able to study, minutely and in detail, one isolated series of facts, and to obtain with more facility a general and clear idea of the arts of the Stone Period. Having to some extent succeeded in doing this, their thoughts are naturally carried from the rude stone implements themselves to the men who fashioned them. Then arise such questions as these:—Who were they? What were they? What was the mental and moral state of these men? Was primeval man a being little above the brute; or was he every whit a man, ignorant as the merest child, perchance, of all the industrial arts, but still in mental powers a man, and nothing less?

According to one theory, man in the lowest, or even in anything approaching the lowest, stage of savagery never did, and never can, unaided, raise himself to a higher scale of culture. It is contended that when such savages are brought into contact with civilised races, it is extremely difficult to teach them the simplest arts; that they seem never to invent or discover anything for themselves, and for the reason that even "necessity is not the mother of invention," except to those who have some degree of thoughtfulness and intelligence;—in point of fact, that we are to regard all savages as degraded men, whose ancestors lived in a higher state of culture; but privation, suffering, or oppression has done its work, and in these savages we see the result.*

Another school arrives at a diametrically opposite conclusion. They consider that the primitive condition of man, was that of savagery in its lowest stage, and that from this condition certain races have independently raised themselves. According to this theory, instead of existing savages being the degenerate descendants of men who enjoyed a higher state of culture, all civilised races have sprung from savages.

There is something to be said for and against both theories, and the truth probably lies between the two extremes.

The assumed inability of savages to raise themselves to a higher state of culture appears at first sight to be borne out by experience; for instance, successive forms of civilisation have swept over the Bheels, in India, but they remain savages still, and although they now carry the breech-loading rifle of the Englishman, they are armed themselves with bows and arrows of the same pattern as that carried by their forefathers in the time of the Greeks. In fact, the state of culture with some tribes appears to have fossilised, and become stationary for an indefinite period, or until destroyed by being brought into contact with races in an advanced state of culture.

Unfortunately, very slight evidence of the early history of civilisation is to be obtained by direct observation; that is, by contrasting the condition of a low race at different times, so as to see whether its culture has altered in the meanwhile. The contact requisite for such an inspection of a savage tribe by civilised men, has much the same effect as the experiment which an inquisitive child tries upon the root it put in the ground the day before, by digging it up to see whether it has grown. At all events, it is a general rule that original and independent progress is not found among a people of low civilisation in presence of a race in a higher state of culture. It is natural enough that this should be the case, and it does not in the least affect the question, whether the lower race was stationary or progressing before the arrival of the more cultivated foreigners.

There is less difficulty in disposing of the other assertion, that savages seem never to invent or discover anything for themselves. If collections, such as that in the Blackmore Museum, teach anything at all, it is that savages in every stage of culture do invent, and do discover things for themselves. The isolation of particular forms of weapons or tools in particular islands or regions naturally leads to the supposition that they were independently invented by the people who alone use them. For instance, I have said that the Fijians were excellent potters, this excellence in the manufacture of pottery led to an extraordinary development of the art of cookery, for they were able to expose their ware to the direct heat of the fire, and to boil their food in this manner. This development of the art of cookery amongst the Fijians led to the, apparently, independent invention of that very civilised instrument, the fork, which they used for fishing the hot morsels out of their various soups and stews, and the use of which appears to be unknown (except as introduced by Europeans) to the other islanders of the Pacific. Indeed, the use of forks in eating was unknown to people so advanced as the Greeks and Romans, and in England we were without forks until the beginning of the seventeenth century.

But if we admit that savages can invent, and consequently progress, in the industrial arts and in knowledge, we must also allow, I think, that decline is possible. Indeed, few will deny that both decline and progress in art and knowledge

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* *Quarterly Review*, No. 256, 1870, pp. 443, 434.

† "Pre-Historic Times," 1st edition, 1865, p. 3; 2nd edition, 1869, p. 3.

* See E. B. Tylor, in Trans. International Cong. Prehist. Archæol., 1868, pp. 11—14.

* See "Origin of Civilisation," by Dr. Whately. See also "Primeval Man," by the Duke of Argyll, in which latter work some of these views are not supported.

are now actually going on in the world, and it is probable that evidence may yet be forthcoming to prove that degradation as well as development has happened to the lower races beyond the range of direct history. The miserable "Digger Indians" of North America, who lead a wandering life, lurking in holes and caves, slinking from the sight of other Indians, and subsisting chiefly on wild roots and fish, were not always in this deplorable condition; for they are in part Shoshonees or Snake Indians, reduced to their present state of degradation by their enemies the Blackfeet, who obtained guns from the Hudson's Bay Company, overpowered the Snakes, took away their hunting-grounds, and compelled them to sink to their present culture-level, causing them to abandon certain arts which they practised in their more fortunate days. The culture-history of mankind, however, is probably not the history of a course of degeneration, or even of equal oscillations to and fro, but of a movement which, in spite of frequent pauses and relapses, has, on the whole, been forward; and there appears to have been from age to age a growth in man's power over nature, which no degrading influences have been able permanently to check.

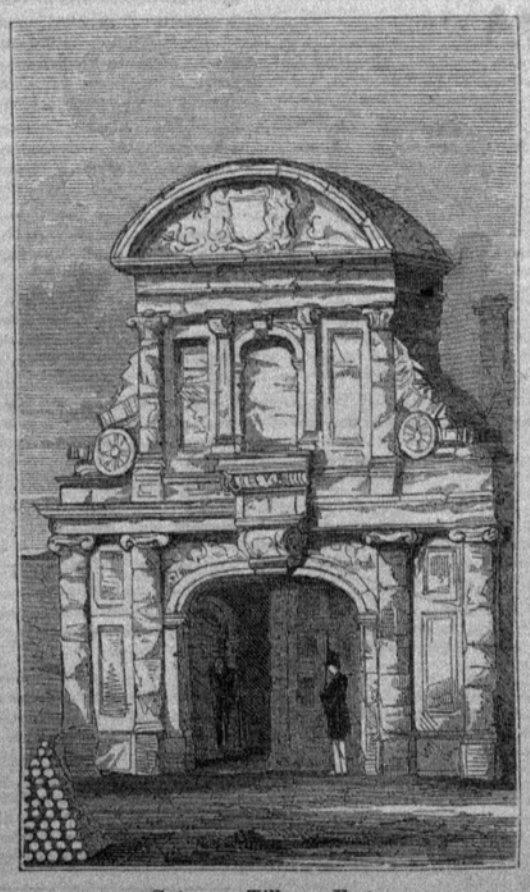
Primeval man appears to have possessed a mind capable of reasoning, disposed to reason, and able to acquire, to accumulate, and to transmit knowledge, thus enabling each succeeding generation to start from a higher and still higher vantage-ground of accumulated knowledge.

I confess that I am unable to trace any unnecessary connexion between a mere babyhood in the industrial arts and a low state of moral culture, but upon this branch of the subject time will not allow me to enter.

Neither can I touch upon another point, of great interest, the question of the Antiquity of Man. I have said that the Stone Period "affords us no measure of time," neither does it of time *positive;* but in arriving at conclusions with regard to time *relative*, the Stone, Bronze, and Iron Periods are as valuable to us as are the successive types of fish, reptile, and mammal to the geologist.

TILBURY FORT.

Every one knows of Tilbury Fort (on the Thames), and recalls Queen Bess and the Spanish Armada on hearing its name. A few days ago the Chapel in the Fort was re-opened, after about half a century of desecration, in the presence of a large number of clergy, officers, soldiers, and the neighbouring gentry. The Bishop of Rochester preached an effective sermon on the occasion, and at the close of the service a collection of offerings was made towards purchasing a harmonium, and providing further fittings. The prayers were read by the rector of the parish, the Rev. R. Henry Killick, who is also the chaplain of the fort. This chapel, which is said to have been consecrated in the reign of Elizabeth, had for many years been used as a billiard and reading room, until the present rector brought the subject before the notice of the War-office authorities, who in consequence have restored it. Messrs. Cobham, of Gravesend, were employed on the work.



Gateway, Tilbury Fort.

SOME OF MY WANTS.

I want bankers to furnish to such of their customers as may desire them key-rings, on which should be engraved the name of the bank, and the customer's number. Thus: "L. D. Westminster Bank, customer 2,409." In case any customers' keys were lost the person finding them would not know the name of their owner, but, on taking them to the bank, the banker could and would restore them.

I want our streets infinitely better lighted, particularly our back streets. What with early closing of shops, and street widening, we seem to have no lights at all in some places.

I want each district of the Metropolitan Board of Works to publish and sell to the public for sixpence a map of the district, say on a scale of 9 in. to the mile; and to deliver them gratis to certain public persons and bodies.

I want the physical and moral good of the town of North Woolwich to be thought worthy of some consideration.

I want the press and the general public to be admitted freely to the meetings of all Guardian Boards, and to the meetings of all vestries.

I want proper officers to be appointed to examine our gas and water supplies, and if the supply should any month be bad that these officers should be empowered to strike off a certain discount from the charges, both public and private, that month to be made by the said companies. If *very* bad the *whole* charge should be struck off.

I want butchers to place on their tickets and their bills the price *per pound* which they charge for their meat.

I want the platforms of our railway stations to be nearly or quite on a level with the floor of the carriages, and closer to them than they sometimes are.

I want carpets beaten on barges or other suitable vessels on the Thames.

I want the classes of railway carriages to be readily distinguished by passengers. A hemisphere of a white colour placed above the door of a first-class compartment, of a red colour above the door of a second class, and of a bright blue colour above the door of a third class, would seem the easiest guide. Smoking compartments might have a black band across their hemispheres.

I want omnibus proprietors to paint their steps white; so that outside passengers of a dark night may see where to plant the foot.

I want railway companies to place at each station a special list of trains stopping at that station. They content themselves with sticking, in perhaps some obscure place, a *general* time-table, and you may find on it the information you want if you can.

I want children in poor schools taught how to clean themselves. If the first half-hour of school were devoted to lavatory teaching and practice, the effect would be very good.

I want the sleeping apartments of domestics, particularly in hotels and lodging-houses, to be strictly examined. Also those of assistants in various businesses, as petty drapers, grocers, &c.

I want a better mode of raising and dropping the glass of railway carriage-doors. Perhaps the late interesting discussion in the *Builder* on sashes may afford some hint for an improvement.

I want in various parts of London maps placed for strangers' guidance. The spot where the map is placed should be distinctly shown on the map.

I want bed-room candlesticks to be made with a receptacle for matches attached to them, and a rough place for striking.

I want whip sockets to be made trumpet-mouthed, and with a hole at bottom, so that the whip may be placed away easily, and the water will run out. Many a poor hard-working horse gets extra cuts because his driver finds it difficult to put his whip away.

I want the Embankment and Finsbury and Southwark Parks to have as many approaches as possible. They need not be too elaborate.

I want the post-office to sell a cheap letter-balance. One would think that for sixpence or a shilling a balance might be sold, and guaranteed to act correctly.

I want blind carts (i.e., those carts from which the driver can only see to the front of him) to be done away with by some means.

I want every householder in London to have a "squelch," and I want him to wash his pavement every day.

I want architects always to carry the stairs of houses up to the roof. That ladder which reaches from the top floor to the roof is invariably in the cellar when a fire happens.

I want persons wheeling trucks, whether empty or not, to have the handles of the trucks towards them, not projecting in every one's way.

I want the cruel, silly bearing-rein to be universally abolished. None but fools use bearing-reins. Government should at once put a heavy tax on these devilish instruments of torture.

I want better lodgings for policemen and curates.

I want, in numbering streets, that the odd numbers should be on one side and the even ones on the other; but I do not want that No. 46 should be opposite No. 145. Divide the street, before commencing numbering, into spaces, say of one-sixteenth of a mile (110 yards), and allow twenty-four numbers to each side of that space.

I want catalogues of private libraries to be lodged in the British Museum.

I want to know how I am to get admission to my own house if I should be out when it catches fire.

I want printing points, as commas and periods, to be more distinct. A period should be a large dot almost as high as the type, a comma should be quite small.

I want a railway-station in Southwark-street. It is a long way from London Bridge to Waterloo Junction. Many a passenger is lost.

I want the various vestries and Boards of works in London, in making their return to the

central Board of what they *have* done during the fifteen years of their present constitution, to make also a return of what they have *not* done.

I want houses to be examined as to chances of fire, and of escape from fire. A nice arrangement that was in a recent fatal fire, which placed the candle-end cupboard under the stairs.

I want water-closet inspection of every house, —light, ventilation, trapping, &c.: all should be seen to by public officers.

I want every landlord of small house property to be compelled to lay on water: one pipe for a row would be enough.

I want little front gardens to be better attended to. Many a poor man, for ten shillings a week and materials, would be glad to keep in order thirty of these (at present) miserable spots. He would make a whole street fresh and beautiful in a month.

I want a constant supply of good water cheap, *and supplied through a good sized pipe*. The trick of making the supply-pipe very small in one part must not be allowed by any means. Nor must water be supplied by meter; were it to be so, some mean wretches would not allow a quart a day to be consumed in their houses.

I want books to be cut at the edges ready for reading.

I want swimming-baths (floating) to be established on the Thames, and I want every London child to be taught to swim.

I want the names of our railway-stations to be called out more clearly. If the person calling out used the word "Attention!" before calling out the name of the station, good, in my direction, would result.

I want a large dining-room, &c., to be established for the City work-girls. Should our City men want to know how to establish one, Sir Titus Salt would soon tell them.

I want a number of Faulkners to be established by our parish authorities all over London. Should any one want to know what "Faulkners" are, he is informed that they are the excellent lavatories, &c., established by Mr. Faulkner at Ludgate Railway Station, at Broad-street Railway Station, and elsewhere. Could not these be established at every fire-engine station? The firemen are very neat, clean, bright fellows, and have a great deal of time upon their hands. Of course, the Faulkner would soon be closed when the men were wanted elsewhere.

I want publishers not to advertise books as "octavo," "post octavo," "duodecimo," "quarto," &c., words to which few persons attach correct ideas; but as "6 in. by 8 in.," "9 in. by 12 in.," &c., those figures representing the inches in length and breadth of the books.

I want "a.m." and "p.m." in speaking or writing of the hour of the day to be done away with. Far better to let the hours run from 1 to 24. Our clocks would require no alteration.

I want our parsons to pay more attention to sanitary matters among their charges. Some of them declare openly that such subjects are no concern of theirs.

I want a new chair to be established at our universities to be called the chair of Sanitary and Domestic Science; and it would not be amiss to make Dr. Lankester and Mr. Rawlinson the first Professors. It would make our young clergy better than our old.

I want the filtering beds of our water companies to be kept neat, and not in so "mangy" a condition as some of them now are. Black, rank grass, dock-weed, insect-covered hedges are not nice accompaniments to the purification of water.

I want tickets to be placed inside cabs, so that without asking the driver a ticket may be taken.

I want proper pavements and roads to be made before houses are allowed to be built. Houses are now stuck up in fields, and years elapse before the approaches are decent.

I want water companies to furnish at the back of their bills an account of where and what their works for gathering, subsidence, filtering, distributing, &c., are; so that consumers may know all about the "manufacture" of the article they pay for.

I want all cab-horses to be inspected by properly authorised persons weekly.

I want oysters cheaper; and now that the demand for oysters for Paris has ceased, I think that they ought to be.

I want two-floored seats to be placed upon the Thames Embankment: the lower ones would be covered, so as to enable a pedestrian to escape from a shower of rain; and the upper ones would be raised, so that the water of the river might be seen from them. Ascent to the upper by steps at each end.

I want milk-vendors to send out the milk and the adulterations in separate vessels, so that each consumer may mix them for himself, according to his taste.

I want the marine-store shops to be placed round squares, or at any rate located together, so that there might be stricter sanitary and police supervision of them. About twenty such collections of these shops would be enough for the metropolis.

I want boots and shoes to fit easy and to look tight.

I want publicans who are proved to sell adulterated drinks to be deprived of their licences. Samples should be tested on system.

I want shopkeepers to paint their shop-fronts often, and of a light colour, so as to help the gaslights considerably. A large retail trader in Holborn, who makes a net profit of 24,000*l.* a year, paints his shop-front a light stone colour two or three times a year, it is said.

I want the pavements kept much more clear of shopkeepers' goods than they are. Some neighbourhoods, as Lower Wandsworth-road, Battersea, where I happened to be a few weeks back, seem to be quite spoiled by the practice of leaving only a small part of the pavement for the public.

I want omnibuses to place outside in large letters where they are going to, and not where they have come from. Reversible boards would do this nicely. Whether white horses should be used as a signal for one route, grey horses for another, piebald for a third, roan for a fourth, and so on, is worthy perhaps of consideration.

I want names of streets, courts, &c., up at all turnings; and in the case of new streets, or newly-named streets, I want for two years at least the name of the street placed on every house.

I want the architect of the New Law Courts to somehow put St. Clement's Church inside his building. It would improve the Strand, it would (in a measure) sanctify the New Law Courts, and it would benefit the church itself.

I want people who *practise* "vociferously" the piano, the cornopean, &c., to live a long way off from me.

I want the names of railway stations to be placed *many times* at each station. If all advertisements admitted were painted in a perfectly horizontal manner, and the names of the stations a little out of the straight, the station name would be sure to catch the eye.

I *particularly* want the projected Mid-London Railway to become an accomplished fact.

I want the river stairs to be looked to by the Thames Conservancy better. A gas-lamp and a hand-rail and a table of fares are simple necessaries at each.

I want the East London (Thames Tunnel) Railway managers to carry out the scheme mentioned by the chairman at a late meeting, and convey third-class passengers from Wapping to Rotherhithe for a halfpenny,—it would be nearly 4d. per mile.

I want the Tower Subway to be opened for more than sixty-six out of the hundred and sixty-eight hours of the week. The Thames Tunnel used to be open every moment of the year.

I want plumbers to be restrained from placing those catch-foot rolls of lead along the outside of their shops.

I want Raphael Brandon's excellent scheme of cheap railway travelling to be carried out.

I want Elihu Burritt's Ocean Penny Postage to become an accomplished fact.

I want all candidates for the office of vestrymen to pass a Government examination. Knowledge of figures, of their own localities, &c., essential.

I want railway companies, when they open a new station, to issue with the tickets for that station a small clear map of the district, say for a mile round the station. They would soon get strangers (the people they want) to go there. Such maps would not cost more than a trifle per thousand. The maps might also be placed in the time-books.

I want—yes, I especially want—a periodic inspection of all basement floors of London. Oh, what a revelation!

I want Miss Burdett Coutts to live for ever.

I want to see the *Builder's* Parliamentary Library established; and, very particularly,—

I want a general index to the first twenty-five years of the *Builder*, including the "Miscellanea."

MITRAILLEUSE.

"RESTORATION AT THE BRITISH MUSEUM."

We are requested to publish the following letter:—

SIR,—My attention has only this day been directed to an article in the *Builder*, of the 8th inst., headed "Restoration at the British Museum," in which it is asserted that the frieze of the Parthenon and other sculptures in the British Museum have been cleaned "by the aid of some powerful chemical, chlorine, or alkali, or acid," to the detriment of their surfaces, which the writer of the article asserts to have been thereby eaten away and disintegrated. As the keeper of the Greek and Roman sculptures in the British Museum, I beg to state that it is untrue that any of these sculptures are ever cleaned by any chemical application, such as the writer in the *Builder* describes. The process of cleaning now going on, and which is repeated periodically, is precisely that "simple washing with water and a sponge," which the writer of the article recommends. C. T. NEWTON.

We can only repeat what we have already said, that to clean a piece of dirty and weather-stained stone or marble by the simple process of *sponging* it over with pure water is an impossibility. By this process, of course, the loose dust is removed, and no damage done, and certainly no *stain* of any kind removed from the surface, even much less from the substance of the stone *below* the surface of it, and to which weather-marks and stains always sink. Should Mr. Newton doubt this, let him request his housemaid to clean the door-step by the mere process of sponging it over with pure water, and wait for her reply. We all know that every weather-stained and dirty door-step in respectable London is daily hearthstoned, as it is termed, merely from the well-known fact that no mere *cleaning* with water and flannel and brush will so far touch it as to *clean* it, or, in other words, reduce it to *an even level colour*. We ask his attention to this fact. Once more, the little portico in front of the Athenæum Club-house is, as probably he well knows, every year or so *cleaned* of weather-stains and marks of wear and tear. How is this done?—by sponging the columns over with pure water? No; they are thoroughly *re-carved* by the process of diligent *scraping* and even cutting away of the stone, because no mere *surface* cleaning will do the work; you must go deeper and remove some of the stone surface itself, and come to the pure stone. All such work as this, unfortunately, is left to the care of common labouring stone-masons; and it is melancholy to reflect on the fact that the subtle work of a great artist should come to be at the ignorant mercy of such agents. Does Mr. Newton really know himself what has been done, and what substance has been used, whether chemical or not, in the cleaning process which has been going on at the British Museum? It is a great question, and worth a little attention. It is absolutely impossible to produce by the simple action of sponging with pure water the *cleaned* effect of the bust of Marcus Antoninus, and the other busts in the Roman Gallery, and in that of the Satyr, which we before particularly mentioned, and we defy any human being to do it. Some *solvent* more powerful than water must have been employed, whatever may be the case just now. Unless, indeed, that water be thrown on it with a powerful *mechanical* force, and thus, as it were, break the stone surface as with a rain of minute bullets. The Mansion House, some two or three years back, was *cleaned* in this way. Were those unfortunate Greek fragments put through this process? But, after all, what does it or can it matter how the Greek work has been cleaned, provided it has been done: no matter whether water or chemical, acid or alkali, weak or powerful—our business is with the deplorable *result*. All signs and evidences of age and time are removed, and the stone or marble looks new as if just from the quarry. Why remove the time marks? With what object has it been done? And how are the works better now than they were when time-marked and with the evidences on them of a great antiquity? Surely the evidence of the time which has elapsed between the days of Phidias and the present hour is a *something* and worth the keeping. Why has Mr. Newton, through a mason's labourer, with sponge and water only, if it be so, washed it all away?

Sir W. Tite, M.P.—According to the *Gazette*, the Queen has been pleased to give orders for the appointment of Sir William Tite to be an Ordinary Member of the Civil Division of the Third Class, or Companions, of the Most Honourable Order of the Bath.

CREWE HALL RESTORED.

The restoration of Crewe Hall, which was almost entirely destroyed by fire four years ago, has just been completed, under the direction of Mr. E. M. Barry, R.A., and on the 12th inst. Lord Crewe celebrated the event with an entertainment. A view and plans will be found in our volume for 1869 (pp. 486, 487). It may be mentioned that one apartment, called the "Cain and Abel Room" is now exactly in the same state as it was when occupied by the Emperor Napoleon some years ago, having almost escaped the ravages of the fire.

In the hall are placed the following lines, composed by Mr. Warburton, of Arly Hall, Cheshire, who is well known for his antiquarian lore:—

> "Ne'er in this hall of olden days
> Rebuilt, may fire henceforward blaze,
> Save that which on the hearth doth cheer
> Each welcome guest who cometh here."

The proceedings began with the consecration of the domestic chapel, the decorations of which have been well executed by Messrs. Clayton & Bell. The consecration ceremony was performed by the Archbishop of York, who was assisted by the Bishop of Chester, Lord Crewe's chaplain, and other clergymen.

At two o'clock Lord Crewe entertained his guests in the dining-room of the new edifice.

Lord Houghton, in proposing "The Architect," asked them, in looking around, to consider for a few moments what must have been the merit and skill of the architect who could have built such a house. Such a work required something more than mere technical ability; it required a full appreciation of our old English architecture, and the means of adapting that architecture to the requirements of modern times. Such an architect Lord Crewe had been fortunate enough to find.

Mr. Barry replied by expressing the pleasure his work had afforded him, and paid a tribute to those who had co-operated with him. An architect was in the position of a commander-in-chief who was necessarily much absent from his army. He therefore required above all things good "eyes" and good "hands" on the work. He had been fortunate in both. In the clerk of works, Mr. Leslie, he had had "eyes" that he could not praise too highly; while it would have been impossible to have fallen into better "hands" than those of Mr. Plucknett (Messrs. W. Cubitt & Co.). He also alluded to those who had so greatly contributed to the artistic effect of the work, Mr. Weekes, R.A., Mr. Marks, Messrs. Clayton & Bell, Messrs. Crace, Armstead, Philip, Powell, and others. He also referred especially to the careful modelling of the elaborate plaster work by Mr. Mabey, who had shown great skill and ability. As to himself, he should never forget the kindness and confidence shown to him by Lord Crewe, at a time when he had too much recent reason to know that architects were not always so treated.

GLENDALOUGH.

The celebrated round tower and ancient churches of Glendalough, in county Wicklow, Ireland, are sadly in want of attention and repair, it would seem. At a meeting of the Royal Historical and Archæological Association of Ireland, held in Kilkenny in July last, Dr. Colles, the chairman, brought before the Society a proposition for taking such steps as might be calculated to preserve from destruction these far-famed architectural and monumental remains. The round tower is becoming very ruinous. The cathedral and the priests' church have suffered woefully from sacrilegious hands. The other churches, round which burials no longer take place, have escaped this danger, but are rapidly being broken up and reduced to mere heaps of stones by the luxuriant growth of young trees in the crevices of their walls. In a statement on the subject, Dr. Colles says:—

"The repairs which should be executed at Glendalough may be divided into the cheap and easily executed, and the costly. The former, which should be undertaken at once, are:—

1. Clearing away the trees from the Abbey, Trinity, Our Lady's, and the Righfeart Churches.
2. Securing St. Kevin's House, and placing all loose sculptures, &c., therein.
3. Repairing the breaches in Trinity and Our Lady's Churches and Cathedral, and in the sacristy and roof of St. Kevin's House.
4. Railing in the Priests' Church and the north door of the Cathedral.

The more costly repairs are:—

1. Thorough repair of the round tower, and restoration of the conical cap.
2. Excavation and restoration of the Abbey.
3. Ditto of the Righfeart Church.
4. Ditto of Our Lady's Church.
5. Excavations in the neighbourhood of St. Kevin's House, and possibly (6) rebuilding the chancel of St. Kevin's House.

In each of the above lists I placed first those repairs which seem most urgently required.

Lovers of the picturesque may be horrified by the proposal to clear away the trees. But only the trees actually growing out of the walls need be interfered with, and with such an abundance of others, these would not be missed. The buildings should be inspected once a year, to prevent fresh seedlings from taking root."

Dr. Colles offered, if the Association sanctioned the proposal, to issue the circulars and work up the preliminary operations as to getting in the subscriptions, which he would hope to have completed before returning to India. As regarded the directing and superintending of the operations, Mr. Graves communicated with Mr. Thos. Drew, F.R.I.A.I., who at once consented to take that portion of the arrangements on himself. Of course, nothing could be done without the consent of the proprietors, in which position the Mining Company of Ireland stood. He had asked a friend, a member of that body, to bring the subject before their Board, and the result was most satisfactory. He hoped that there would be no difficulty in collecting a sufficient sum for the purpose, considering the great importance and historic interest attaching to Glendalough; and he was already promised a donation of 10*l.* as a beginning.

Mr. Graves said this was not the first work of the kind their Association had undertaken and accomplished. They had collected and expended a large sum for the preservation of Jerpoint Abbey, and nearly 200*l.* for the reparation and protection from further injury of the seven churches of Clonmacnois. He would expect even a wider sympathy for the proposed work at Glendalough, as the ruins were more generally known, and their scenic and architectural beauty appreciated by the public.

The Chairman said that returning to Ireland lately, after an absence of twelve years in India, it had made him most sad to witness the serious deterioration which had taken place in the ruins at Glendalough in the interim.

The cordial approval by the Association of the arrangements proposed by Mr. Colles was unanimously agreed to.

Mr. Graves observed that perhaps it might be possible to obtain some assistance from the Government towards such an undertaking, if the public first showed that they were willing to exert themselves to carry out the object, by subscribing.

THE METROPOLITAN SCHOOL BOARD.

The Executive of the Social Science Association, feeling the great importance of obtaining an efficient school Board, wisely called a meeting for Wednesday last, to consider whether any steps might be taken to assist in securing the election of men without reference to their political or religious opinions, and solely on the ground of their personal fitness and acquaintance with the educational necessities of the metropolis. Dr. Lyon Playfair occupied the chair, and stated the object of the meeting. Mr. Edwin Pears pointed out the importance of having men on the Board who were acquainted with education, and could form an opinion on such questions as whether large or small schools were the more desirable, and what should be their general organisation, instead of men whose chief qualification was that they were connected either with the League or the Union, or with some peculiar views as to party or sect. Mr. M'Cullagh Torrens, M.P., as the author of that part of the Bill under which the Board would be formed, urged that almost every part of London differed from the other intellectually and morally, and it was essential that the specialities of all should be thoroughly represented at the Board. The meeting was not held to put forward candidates, but merely to point out the principles on which the selection should be made. Referring to the great extent of the electoral bodies under the Act, he expressed an earnest hope that the franchise would be used honestly and with discretion, as became the occasion and the great purpose in view; and speaking of the accumulative vote observed that it was intended to be used only as a defensive weapon in time of need, and not as an ordinary working tool. The Board should not be legislative, but judicial and administrative, and he hoped that no one would enter it tied up with pledges or tests of any kind, while at the same time he should be sorry to see any section or any opinions excluded. Unless the people had confidence in the Board its labours would come to nothing. On the motion of Mr. G. W. Hastings, seconded by Professor Amos, the following resolution was passed unanimously:—

"That in the judgment of this meeting the opportunity which is now for the first time afforded to the ratepayers of London of electing a School Board for the entire metropolis, and, therefore, of making adequate provision for the education of the people, is one which imposes upon the ratepayers, individually, as well as collectively, the duty of bringing forward and supporting candidates, who, from their acquaintance with the educational necessities of the metropolis and with the educational system of this and other countries, as well as from their known sympathy with the large classes who will be more immediately affected by the provisions of the Education Act, will be likely to make efficient members of the School Board, and do their duty without regard to sect or party."

The resolution was supported by Mr. Payne, Mr. Godwin, Mr. Chadwick, Canon Cromwell, and Mr. Applegarth. Mr. Biggs then moved a resolution authorising the Education Committee of the Association to take measures for the carrying out of the principles set forth in the first resolution, which was seconded and carried.

The subject is one of the greatest importance, and we would strenuously urge on the ratepayers the necessity of giving the most careful consideration to it, so that men may be elected who understand the subject and sympathise with the wants of the poor.

THE HABERDASHERS' COMPANY.

The dinner given by the Master and Court of this ancient Company on Tuesday last was very noticeable. Mr. William Hawes, the present master, had gathered around him as visitors a number of eminent men, and in proposing their names as toasts under various heads, made some singularly appropriate and effective speeches, which elicited responses similarly striking. Thus Major-General Brownrigge and Captain Sherard Osborne spoke for the army and navy; Professor Tyndall and Sir William Fergusson for science; Mr. Newmarsh and Mr. Leone Levi for science as applied in practice; Baron Gudin, the well-known French marine painter, for art (making a touching appeal for his country at the same time); and several others on cognate subjects. The City was not neglected, Alderman Finnis and Sheriff Jones representing it. The hall, built a few years ago under the direction of Mr. Snooke, the company's architect, has been recently effectively decorated.

EXHIBITION IN BOND STREET.

A Winter Exhibition of Pictures has been opened at what is termed the Old Bond-street Gallery, and comprises 346 works, of very various degrees of merit. "In Black and White" (21), C. S. Lidderdale; "The *Pallas* refitting at Devonport" (28), H. T. Dawson; "On the Lesser Neath, South Wales" (57), J. B. Smith; "Roses" (61), J. Blackham; "A Bank of Wild Flowers" (294), A. Nicholl, a little over-large; and "The Eve of Life" (66), P. Jackman, will be found bright spots in a somewhat sandy plain. Mr. Chester, Mr. Frost, A.R.A., Mr. Weekes, Louise Romer, Mr. Rossiter, Mr. Ernest Griset, and others, also contribute agreeable works. "Monkey Island" (310), H. Bright, is an amusing piece of extravagance.

THE SEWAGE QUESTION.

Edmonton.—The local Board of Health at Edmonton has just decided upon carrying out a thorough system of drainage and upon the utilisation of its sewage. Up to this time the sewage of the district has been allowed to pass into the River Lee, to the pollution of its waters; and the Home Office and the Lee Conservancy Board have both protested, the latter threatening to enforce the heavy penalties it is entitled to by law. The local Board has at last decided, however, to adopt the drainage and utilisation works recommended by Mr. Eachus, C.E., and to entrust to that gentleman the carrying out of the design.

Birmingham.—One of the principal and most embarrassing questions now occupying the attention of the Birmingham Town Council is that of the utilisation of the sewage of the town. The outfall at Saltley was at first understood to be simply an experiment; but by degrees it has grown into large and permanent works. This accumulation of sewage matter, says the local *Journal*, is a stupendous and continual nuisance; and, with two or three injunctions held *in terrorem* over its head, it behoves the Corporation

speedily to devise some means of utilisation which shall relieve the residents of Gravelly Hill and Erdington of an evil they have long suffered, and the borough from the liability of heavy legal proceedings. In view of the discussion which will shortly arise on the subject, several members of the Council have visited the works at Saltley. Councillor Walker has for many years advocated that the sewage shall be pumped up into a reservoir, not more than 100 ft. above the level of the mouth of the sewer, below which, he says, there is plenty of adjacent land to consume the whole of the matter, even if it were used over 20,000 acres. The owners of land, he thinks, would doubtless be willing to pay such a price as would recoup the Corporation for the outlay. In order to test his theory, Mr. Walker, about six years ago, gave a pump which was put down at the outfall, and by which sewage has since that time been forced through a carrier to boats on the canal. Mr. Walker has modified his original plan to the extent that he now suggests that the sewage should be sent into depôts on the high lands, where it should be left to consolidate, and from which the farmers would fetch it as they required. Various objections are raised to the scheme, the principal one being that it is too expensive. The plan advocated by those who oppose Mr. Walker's scheme is that the sewage shall be carried by gravitation through conduits on to land on the side of the Tame, to be purchased by the corporation, either under powers which they now possess or by special Act of Parliament. It is stated that between the outfall and Water Orton there are 3,500 acres of land upon which the 20,000,000 gallons of sewage daily raised could be employed in irrigation, sufficiently to so purify the water running off as to make it harmless to the fish in the river. As matters stand at present, these seem to be the two schemes between which the corporation have to decide.

Cheltenham.—The first annual letting of the sewage farm by auction has just taken place. There was a very large company present. The farm of 119 acres, exclusive of one field kept by the commissioners for experiments, is all pasture land, and was divided into six lots. Notwithstanding that the sewage has as yet been but imperfectly applied to the farm, the prices realised were very high, and will be sufficient to guarantee the town, notwithstanding the large outlay to which it has been put, against any loss. The rate per acre varied from 5*l.* 18s. to 8*l.* 13s., and the total was about 870*l.* for the year, leaving out of the question thirteen acres reserved by the commissioners, and which, having been laid down with rye grass, is expected to realise 20*l.* per acre. The total yearly payment for interest and repayment of the thirty years' loan is 1,100*l.*; so that even at the rate per acre obtained the first year, the difference between the receipts and the yearly charge would be very small, while the farm will be the freehold of the town, and the works paid for at the end of thirty years. Under the deodorising system, and with continual threats of action for fouling the brooks, the yearly cost was little short of 1,000*l.*

VESTRY REPORTS.

St. Mary's, Islington.—The annual report of the local surveyors of highways, 1869-70, has been issued in a printed form. According to this report, expectations from the steam road-roller of Messrs. Aveling & Porter have been fully realised. The roller is a 15-ton one, and not so heavy as to crush material, or do any serious damage to gas or water mains, shallow drains, &c. The stones, by being fixed at once, are not reduced to round pebbles on all their faces as heretofore, in the supposed economical mode of making the public traffic do the work, to the torture of horses and damage to vehicles. The metal is thus fit for new fixture when the road requires breaking up. The roller is supplied with steel spikes to the driving-wheels, to aid in the breaking up.

The average number of yards rolled per day for each street, was as follows:—

	Superficial yards.
Upper-street	658·730
Highbury New Park	956·923
Holloway-road	395·924
Park-street	594·000
Canonbury lane, square, and place	643·473

or an average of 650 superficial yards nearly per diem. The cost of rolling (including labour, cartage, watching, water, coals, coke, wood, oil, &c.) was 4*l.* 3s. 6·235d. per diem, or at the rate of 1·541 pence per yard. The character of each work varied.

The streets are now cleaned by one of the sweeping-machines and one of the scraping-machines of Messrs. Smith & Son, of Barnard Castle, Durham. The reporters, Messrs. Cormack and J. A. Clements, strongly recommend them. They have found that whereas the sweeping-machine (including two men, wear and tear of machine, oil, and brooms), costs 16s. 3d. per day; the same amount of work done by hand-labour (including nine men and wear and tear of brooms) would cost about 1*l.* 9s. 2d. per day, or at the rate of 55·71 per cent. in favour of machine-work. The scraper, with the same allowances, they find costs about 15s. 0½d. per day; whilst doing the same work by hand-labour would amount to about 1*l.* 18s. and a little under a farthing per day, or at the rate of 39 56 per cent. in favour of machine-work. These calculations are without the cost of purchase and interest, which would be very small.

The first cost of the scraper is 26*l.* 15s., and that of the sweeper 16*l.*

There are 74 miles of roads and 136 miles of footpaths under jurisdiction in the parish.

Holborn District.—The usual sanitary report by Mr. Septimus Gibbon, medical officer of health for this district, has been printed. The death-rate has here been 25·69 per 1,000, or above the average (24·66), but slightly below that of the central districts.

During the past year, the Artisans' and Labourers' Dwellings Act has been applied to fourteen houses in Bell-court, Gray's-inn-road, and to ten houses in Union-court, Saffron hill. The works ordered in the former court comprising additional cisterns over the closets, dust-bins, and extensive repairs, especially to all the window-frames, have in all but four houses been carried out in a satisfactory manner. In those four houses the leaseholder is executing the specified works in a dilatory manner.

The houses in Union-court will all be taken down, as soon as the negotiation for their purchase by the Corporation of London is completed. The sanitary improvements effected have been numerous.

St. George the Martyr, Southwark.—The 14th annual series of reports for this parish has been printed. The report of the Medical Officer of Health, Mr. H. Bateson, M.D., states that the fears of relapsing fever have not hitherto been realised. The scarlet fever epidemic, however, has prevailed here, as elsewhere. The deaths in the parish from all causes were 1,740, and in excess of the preceding year by 239.

WORK WITH A WILL.

Mr. Leone Levi delivered the introductory lecture to the Evening Classes at King's College, London, on the 7th inst.,—an appropriate and eloquent discourse. In the course of it he said,—

There is a great completeness and variety, certainly, in our scheme of studies for the session we are now commencing; and I can well imagine that it may be a source of grave deliberation with many students ere they can decide which of these attractive studies is entitled to their special preference. To learn them all is impossible. To have a smattering of many sciences is of but little use. But you need have no such difficulty of selection if you have some definite idea of the occupation or profession you wish to follow. Do you nourish a silent desire to be a great merchant—to become a millionaire some day, sooner or later? Do you wish to have a seat as a governor of the Bank of England? Or to reach the position of scientific producer, like Whitworth, Armstrong, or Fairbairn? Or to possess the skill and calculating power of a Watt, or the engineering grasp of a Stephenson? Or do you, *bonâ fide*, anticipate the day when you may be the Lord High Chancellor? Are these the fancies that run in your mind whilst you are quietly pursuing the studies before you? My friends, I congratulate you for nourishing in your hearts the ambition of rising to great altitudes. It is well to have an honourable ambition. But you must not lose time. Begin at once to learn those branches of science which you will absolutely require. Suffer nothing else to distract your mind, or to dissipate your powers. The great difficulty you have to contend with is a disposition to frivolity, restlessness, inconstancy. Have, then, a stern, unsubduable will to conquer, and you will conquer everything. When Alfieri was asked how did he succeed to become a poet, he answered,—

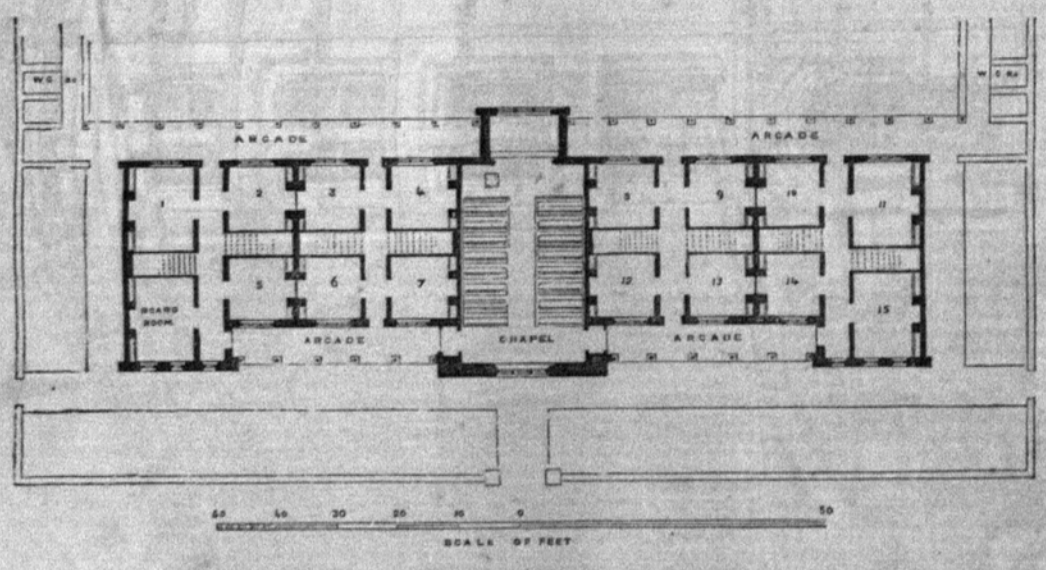
"Volli, semque volli, e fortissimamente volli."

"I willed it, I always willed it, and intensely willed it." Depend upon it, it is not so much to any natural gift that we owe our success, as to the firmness, and even obstinacy, with which we set ourselves to master the difficulties before us. And dismiss any idea, I pray you, that you will get on quite as well without any hard study, for it is not so. It is now universally admitted that scientific knowledge is absolutely necessary for every industry, and employers will not employ persons who do not possess it. We may fancy that a mechanic or artizan, a clerk or an officer, may become, by practice and observation, insensibly disciplined to perform works by the hands with wonderful dexterity, but I doubt whether the clear head and the sound judgment necessary for any profession can be acquired by merely inspecting what others are doing. Let the transactions of a counting-house be ever so important and diversified, let them be ever so judiciously conducted and methodically adjusted, yet if a youth is not furnished with the requisite knowledge to obtain the best advantage from what he sees there transacted, he will not be much the wiser for it. All that is done will seem to him much confused and perplexing, and, after years of labour, he may remain utterly unprepared to take a wide and firm grasp of the various operations which are necessary in the prosecution of business. A combination of study and practice is the best preparation for the professional or mercantile career.

THE MEANING OF TECHNICAL EDUCATION.

At a meeting held in the new Mechanics' Institute, Slaithwaite, at which Mr. Sugden presided, Mr. Buckmaster, after explaining the scheme by which aid is given to classes established for teaching drawing and science, went on to say,—Although I have been engaged for some years in directing public attention to the importance of science and art as a part of national education, I have never been able to attach a very definite meaning to what is now called technical education, which, in its rigid definition, means teaching the arts, but, in its popular definition, means teaching almost everything. I wish you to understand that all I have ever advocated is the teaching of elementary science and drawing, pure and simple, leaving the practical application of this knowledge to the workman. Teach a carpenter some geometry and mechanics, and he will find the practical application of these sciences to a hundred different purposes in the workshop which would have escaped the notice of purely scientific men. Science with practice is the true principle upon which we ought to proceed, and all that we can hope to do is to teach science, and not be over-anxious for immediate results. An argument which is frequently urged in favour of scientific instruction is that other countries are beating us in many of our important industries. I see the Lord Mayor of London demolished this argument by counting the number of steam-engines between Boulogne and Paris which were made in English workshops. On the Great Eastern Railway he might have counted an equal number made in Belgium. In those industries requiring a knowledge of art other countries are no doubt equal, and perhaps superior. With reference to the great industries of iron, machinery, cotton and woollen manufactures, I am not competent to offer any opinion. It is, no doubt, the duty of every man to be as perfect as possible in that industry by which he serves the community and provides the necessaries and comforts of life for himself and his family, but this is not the highest good. Men are not to be taught these sciences because they have to build houses, construct steam-engines, and weave cloth. Men are to be educated because they are men; and every labourer ought to strive for that higher life and culture which nothing but that special knowledge called science will ever give him, and which is far more valuable in the prosperity and happiness of a state than cheap cloth. Science will do much towards making many occupations more healthy and cheerful. It will some day or other wipe away those volumes of smoke which cut off all visible communion between heaven and earth.

EARLE'S RETREAT, FALMOUTH.—Mr. Alexander Lauder, Architect.



Plan of Ground Floor.

EARLE'S RETREAT, FALMOUTH.

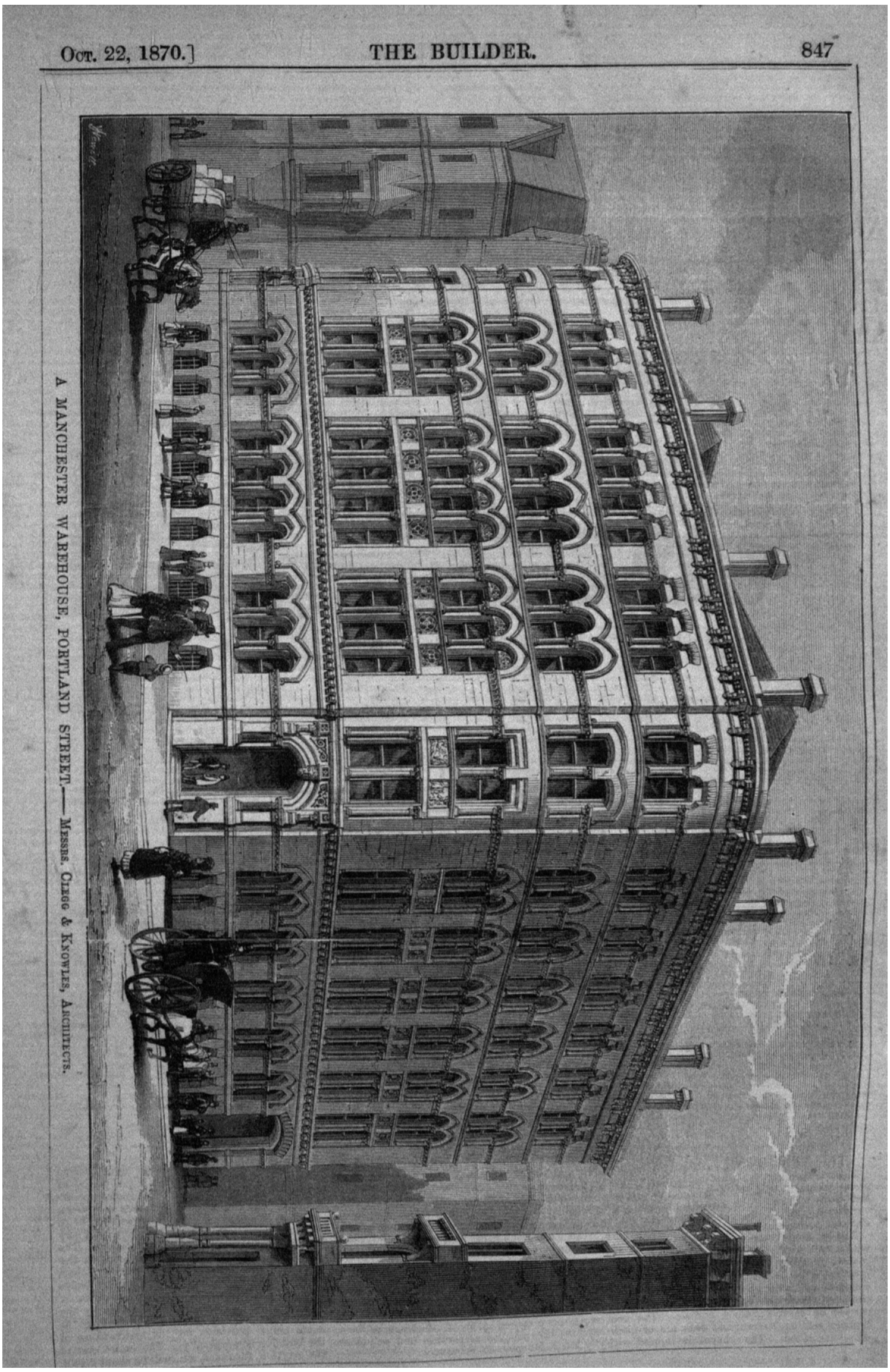
Earle's Retreat, Falmouth, or, as we should prefer to call it, the Earle Retreat, the gift of Mr. George Earle, of Philadelphia, occupies a very healthy and eligible site on one of the most elevated positions in Falmouth.

The buildings comprise a chapel, surmounted with a bell turret, a board-room, and thirty-two rooms, providing accommodation for fifty-two inmates, with all the needful accessories. The chapel is seated for 150 persons. It has an open-timbered roof, in four bays, the principals carried on carved granite corbels. The roof timbers, seating, lectern, and desk are of pitch-pine, varnished. The chapel is lighted with geometrical windows, of Bath stone, filled in with stained glass, supplied by Mr. Solomon, of Truro.

The dwellings are approached by two arcades, of five bays each. The pillars stand on granite bases, and consist of polished polyphant shafts, carved Bath stone caps, with arches in alternate bands of red and white bricks. The dwellings are light and airy, are fitted with closets, and comfortably furnished.

The buildings are erected from the designs of Mr. A. Lauder, architect, of Barnstaple, by Mr. J. Roberts, builder, of Falmouth. The freestone work was prepared by Mr. W. Yonings, of Barnstaple; the polished serpentine and polyphant by Mr. J. Murphy, of Penzance.

This munificent provision is for aged natives of Falmouth or for residents during a period of not less than twenty years. The rooms are arranged for married couples, widowers or widows, bachelors or spinsters. The inmates must be of well-known good character, independent of any particular religious or political opinions. The sole government of the Retreat is vested in the brother of the founder, Mr. Frederick Hobart Earle, during his lifetime. Afterwards by twelve persons to be elected, six by the corporation of the town of Falmouth, and other six by the Local Board of the parish. The founder has made ample provision for the maintenance of the building in perpetuity. The entire cost of the erection, furniture, &c., will be about 2,100*l*.



A MANCHESTER WAREHOUSE, PORTLAND STREET.—Messrs. Clegg & Knowles, Architects.

WAREHOUSE, PORTLAND-STREET, MANCHESTER.

This warehouse (the property of Mr. William Carver), now in course of erection, from the designs and under the superintendence of Messrs. Clegg & Knowles,—to whom Manchester is indebted for other specimens of warehouse architecture,—is being built for Messrs. George Frazer, Son, & Co., merchants, of Manchester. The building occupies a site bounded by Portland-street on the west, Silver-street on the east, Abingdon-street on the north, and David-street on the south; comprising an area of 884 square yards. The principal fronts to Portland-street and David-street are entirely of stone, with red granite shafts to the entrances. The other fronts are of brick and iron work. The style adopted is Italian Gothic, with carving freely applied. The warehouse contains a sub-basement for the machinery (sunk about 20 ft. below street level), basement story for the packing-presses, ground-floor, and four upper floors, with an attic in roof. The principal offices and sample-rooms are placed on the first-floor, the other floors being appropriated to warerooms and offices for the several separate departments of the Manchester trade. The sub-basement will contain eight hydraulic packing-presses, with 14-in. rams, to lift 360 tons; two 25-horse boilers; two 20-horse high-pressure steam-engines; six sets of pumps; and all other machinery requisite for working the hoists and cranes. A covered loading-way extends through the rear of the building from Abingdon-street to David-street, containing a loading platform, two swing cranes, and two hoists for raising goods. Mr. William Southern, of Salford, is the contractor for the superstructure; Messrs. Higgins & Son executed the cellars and foundations. The machinery is being fitted up by Messrs. Norbury & Shaw, engineers, Salford. The carving is being executed by Messrs. Simpkin & Stewart, from designs supplied by the architects.

The building may be taken as a good example of the warehouses which are common in Manchester.*

THE SOCIAL SCIENCE ASSOCIATION.

A FEW NOTES THEREON BY A WORKING MAN.

Sir,—Before the echoes awakened by the late meeting of the Social Science Association are lost in the distance, I wish to say a few words to the members of working men's societies upon the great importance to them of taking a larger part in the annual proceedings of that great association. It seems to me a meeting once a year, and the reading of some papers at the society's office to a few select gentlemen, is not sufficient for the ventilation of the great questions opened at the annual meeting. Last winter a course of four lectures was given on health and economic science, and they met with partial success: that, so far as it went, was something towards further utilising the Association and extending its influence. That is not enough. What I want to see is, the members delivering lectures on vital statistics and economic laws, wherever there is a working-man's or any educational institution. As the members of the Association are to be found in almost every town in the kingdom, they could become the nucleus for forming sociological societies throughout the country, and open up great and important questions, which have hitherto been neglected by every class of the community. The disease of neglect is fearful to contemplate; it is rampant in every house, and injurious in every home. If the objects of the Association were generally taught, and sanitation, in its widest phase, became a household question,—and it might if it had home missionaries who properly understood the physical wants of the nation,—the science of life and order would soon form a part of the every-day existence of the people. At present the Association is only a nine-days' wonder, to be then forgotten until the next annual meeting.

Looking over the reports given by the daily papers, I was surprised to see the small amount of interest the meeting elicited. The *Times*, the great organ of public opinion, was a day behind in its report; and if its readers happened to be readers of the *Standard*, they would have been ahead of the *Times*, as the President's very able address did not appear until the *Friday*. It followed that course throughout, and at the close it gave the members a knock-'em-down in the shape of a leading article, condemning the objects of social reformers and the further meetings of the society. And as the big one, so the smaller. The little gentleman hailing from Fleet-street, calling himself Mr. *Punch*, in a paragraph, which was neither satirical nor funny, describes the proceedings as "twaddle." In the opinion of the satirist, it is twaddle for a large number of the best men and women of this or any other country to meet for the purpose of discussing the wrongs, miseries, and evils which humanity now suffers, and which are not fixed by any law excepting the immoral one, but are all removable by taking a proper course; and the object of the Association is to provide the means and remedies for the removal of the social diseases which now afflict and scourge society. Fie, Mr. *Punch!* you did better in your youth. Humanity thus suffers. The members of the Association know that most of the ills are by proper treatment removable. Science advances, but as yet it has done but little to alleviate the condition of the masses. Progress is obstructed through the ignorance of the many and the selfishness of others. Man's inhumanity is the cause of many evils, and when one considers the present condition of society, with its labyrinths and mazes, some of which are still untrodden; its general chaotic state; with its wealth and poverty, the latter often in such close proximity that it jostles the other,—Lazarus, in the lowest depths of despair and misery, for whom no Abraham's bosom is provided, often wishing the earth would open and swallow him, is in many instances scarcely a stone's throw from Dives and his sumptuous family, who flaunt about with their lofty airs, and seem to think the earth was created for them, and them only. I have often, on looking out of the back window of some high mansion, compared the inside with the out, and have asked the question whether there is no danger in the contrast. A general uneasiness pervades the working classes; the best of them are dissatisfied with the condition of things, and the lower strata will not bear examination. Thunder is heard in the distance; the storm is brewing; every upheaving brings it nearer. The darkness is portentous. Some day it may break, and shatter the fragile vessel now called upper society. It may, by judicious foresight be avoided, and, as all reforms are preceded by discussion, and all remedies to alleviate human suffering are subject to the same law, talk is essential to the progress of mankind. It leads to work, and as concerted and individual action is required for the great work which the Social Science Association has undertaken, the jeers of the would-be witty, and the sneers of the so-called organs of public opinion, are in every sense indecorous, and show a callousness to human suffering, and an obliquity unworthy of them.

Among the various subjects discussed, none were of greater importance than that relating to criminal statistics. In modern society robbery is a crime punishable by law; that is, some forms of robbery, where articles of value, if only to the amount of a penny, are taken. The persons so acting are liable to incarceration till justice as meted by magistrates is paid and satisfied. There are at present different degrees of criminals: the hardened gaol bird, known as the habitual criminal, often a victim of parental misrule; with him crime is a trade, and looked at as the proper means of gaining a living. Another class is the casual or accidental class of criminals, and both are the vicious offsprings of the present state of society. Criminal law, too, is somewhat like its victims, desultory and uncertain, as the sentence is left to the caprice of the magistrate and judge's idea of what is sufficient punishment. The causes of crime are entirely overlooked, and, in fact, there is no part of law in which more anomalies exist than in the one known as criminal or felon law. The condition of society is not favourable to the right understanding of *meum et teum*; and the remark that an honest man is a fool, and is sure to go to the wall, as he is out of place in a dishonest age, is a common saying among workmen. It is a suspicious age,—at least so far as the transactions between individuals are concerned. It is said that like begets like, and, as many are dishonest, they are of the opinion that every one is an exact counterpart of themselves. Fraud, cunning, and hypocrisy are the characteristics of the age. The tradesman does not steal, or take a purse direct from another man's pocket; but in business—and really the word is a wonderfully convenient one; and he who by misrepresentation persuades some one to give a shilling for an article worth only sixpence, is looked upon as a clever salesman who has made a good bargain. Surely this is a wonderful age! An honest man from a distant country, happening to be in this world of London, must be much struck by the sign-board representations. Everything is genuine: no shoddy or veneer—everything is real. "Good man, enter here and buy; you cannot be deceived, as my transactions are above-board." The law, so strict and enforceable against the man who steals a penny in a direct way, has no hold upon the man who robs me of a shilling in an indirect form. And at the present time another Blackstone is wanted to define the law of things, and what are public rights and wrongs. From early years to old age, many workmen are engaged in nefarious transactions for the benefit of their employers. They are thus a party to the common frauds, but are not participators in the profits. The influence of such work must have a deteriorating effect on the life and morals of the workmen. They, through knowing their employers are continually cheating the public, become so habituated to dishonesty, that they cannot see anything wrong in taking from the employer that which they require, and which they believe is a remuneration for their joint robbery of the public. The causes of crime are rarely, if ever, considered in the proposal for its eradication. But in future legislation they must be considered. To have honest workmen there must be honest employers; not schemers, who shuffle at every turn, and in the course of business cheat every one they come in contact with. Some more notes, "On Pauperism and Labour," I had put down, but I find there is no room. But what I have written is, I think, of some little interest: it is what the workmen say, only in a slightly different form; while honesty is a crime, and fraud business, the influence of such opinions will injuriously affect the character of the whole community.

Jack Plane.

* Several important buildings now in course of erection in Manchester will shortly be illustrated in our pages. The new Exchange in our next issue.

SURVEYS OF TOWNS AND DISTRICTS, AND HOW THEY ARE MADE.

Apart from all scientific considerations, and others of a national character, it must be admitted that the trigonometrical survey of the United Kingdom has, so far as the public and individuals are concerned, more than fulfilled the object it was intended to accomplish. It is, in fact, the only reliable survey of the country that we possess, for that executed under the authority of the Tithe Commissioners includes only certain districts and localities. As the latter was made for a specific instead of a general purpose, its application becomes very limited in its sphere; and, moreover, the majority of the plans are little better than useless to a professional man. This arises from two causes: one is the time that has elapsed since they were surveyed and plotted, and the other that accuracy is not their distinguishing characteristic. Surveyors have but little reason to bless the Ordnance Survey, as it undoubtedly deprived them of an enormous amount of future work. It is not too much to assert that it completely extinguished them as a separate profession, and made surveying a subordinate branch of the business of a civil engineer, in which state it has since remained, and it will probably always do so. There is very little question but that the introduction of railways also assisted to bring about this merging of the inferior branch into the superior. The regular old-fashioned surveyor was purely and simply a measurer. His knowledge and capabilities seldom went beyond the chain, offset, rod, and cross-staff, and the man who was acquainted with the mysteries of the most rudimentary angular instrument was regarded with mingled feelings of envy and admiration. The scales upon which the trigonometrical survey was plotted, 1 in. and 4 in. to the mile respectively, were too small to be of any real utility, in cases where the ground was to be occupied by extensive and important architectural and engineering works. The latter scale, however, answered pretty well for general purposes, in which the subject of preliminary plans and estimates was alone under consideration. This was the minimum scale allowed, by the Standing Orders, to be used for the Parliamentary plans of proposed lines of railways, harbours, docks, waterworks, and most kinds of engineering projects. Consequently the necessity for making a separate survey of the land through which the railway ran was obviated in

all districts which had been plotted and mapped on the 4-in. scale. *Hinc illæ lacrymæ*, say the surveyors.

But however well the Ordnance plans were adapted for general utility, they failed, in consequence of the smallness of the scale, to answer in instances where works of a detail character were concerned. Thus, although adequate for the Parliamentary plan of a line of railway, they were totally inadequate to afford a proper or accurate delineation of the ground for the working or contract plans. The latter are plotted upon a minimum scale of 200 ft. to the inch, while the former are on one of 1,320 ft. to the inch. Reduced to what are termed natural scales, the usual method adopted by French engineers for expressing the proportion between the actual object and its representation on paper, they would be respectively equal to $\frac{1}{2400}$ and $\frac{1}{15840}$. In order to extend the advantage of the Ordnance survey to towns, it is intended to publish, by degrees, a series of plans, upon the enlarged scale of $\frac{1}{500}$, or 41·66 in. to an inch, so as to admit of drainage and other works being at once laid down upon them, without necessitating a survey of the district. Some of the parishes near London have been published to this enlarged scale, but for several reasons they do not fulfil their intended object. In the first place, they are enlarged plans—that is, they are enlarged from the other plans on a smaller scale, and it is well known that, notwithstanding all the care and skill in the world, enlarged plans are not accurate. They certainly serve exceedingly well to exhibit in a general way, any proposed scheme of drainage, sewerage, or other engineering works; but when these have reached the stage when they pass from contemplation to execution, it becomes necessary to have the whole district carefully surveyed. At present there are but very few of these enlarged Ordnance maps published, and it will be a long while before they become numerous. As specimens of graphical art they are very indifferent, and not to be placed in comparison with the splendid examples from which they are enlarged. This is only what might be expected, when it is borne in mind that they are zincographed: a process that does not admit of delicate work. There is one use, or rather abuse, to which these enlarged plans are put, to which we shall presently refer, and for which, it must be acknowledged, they hold out strong temptation to the unscrupulous. On the other hand, local boards and others who employ surveyors, by their parsimonious and niggardly manner of dealing, indirectly contribute to the fault, and may certainly be, in one sense, fairly regarded as *participes criminis*. True economy is far removed from parsimony as from extravagance. It is a happy mean between the two, and somewhat difficult to arrive at. It has nothing to do with the amount of actual value of the objects under consideration. The rich man is not unfrequently a miser; and the beggar, in his own way, can be as extravagant as the prince.

A fresh survey of a large portion of the parishes throughout England will undoubtedly be necessitated by the drainage and sewerage works, which must sooner or later be undertaken by every town in the kingdom having a population beyond five or six thousand. It will not be long before the result of the labours of the Rivers Pollution Commission will be made manifest by the passing of an Act forbidding, under heavy penalties, the discharge of any sewage or refuse matter of any kind whatever into a river, stream, or natural watercourse. We frequently witness in the advertising columns of this journal notices requesting surveyors to send in tenders for the survey and plans of a certain district. One of these instances has lately become notorious, and we will therefore select it as a very good example of the manner in which these jobs are managed. We have taken the trouble to carefully go into the estimate of the work to be done, the time it will take, and the actual expenses of chairmen, assistants, mounted papers, and other items inseparable from office work, and have not the slightest hesitation in asserting that it is simply absurd to suppose that the work could be properly performed for the amount accepted. It is about a third of what the tender for *bonâ fide* work should be, and constitutes another instance of the miserable penny wise and pound foolish principle by which all local authorities appear to be actuated. The answer these gentlemen will make will be,—"But we do not get our plans and surveys executed at this 'absurd' price; there they are hanging up in the board-room. Go and see how beautifully they are done." We have looked, and we have seen them, and greatly admired the colouring, the lettering, the thin lines, and the thick lines, and come to the conclusion that they were excellent specimens of the draughtsman's art; but there their merits terminated. Upon checking them by actual measurements on the ground, they have been found to be "so far out" as to be almost worthless for the real purpose for which they were intended. Many will perhaps exclaim, "What signifies a few feet one way or the other?" If the plan continues to hang always on the walls of the board-room, it certainly is not of much consequence whether it be accurate or inaccurate. But let us suppose the following case, which is not of uncommon occurrence, and will probably be a very common event. The local authorities require land for irrigation. They apply for their powers of compulsory purchase, and the landowners, ratepayers, and other interested parties organise a formidable opposition. Under these circumstances the Local Government Act Office appoints an arbitrator, generally two, consisting of an engineer and a barrister, the one to sift the plans and the other the evidence. There are counsel employed in the case, and each party produces its scientific and professional witnesses. The plan and survey of the district is the key to the whole matter; it is essentially the *pièce de résistance*. It is examined by hostile engineers, scrutinised by hostile counsel, and if there is a flaw or mistake in it, there is not the slightest chance of its escaping detection and exposure. We do not go so far as to assert that the party would lose their case on account of the inaccuracy of their plan; but it would certainly not advance their interests.

Let us now proceed to investigate how the existence of the Ordnance or any other maps enables a survey and plan to be completed at a much lower rate than if those auxiliary plans did not exist. If there are no plans whatever of the district, every feature of the surveys and every object on the ground must be obtained by actual measurement, or they cannot be otherwise plotted on the plan. Some of them can of course be sketched in, and no doubt very frequently are, when the price paid is not sufficient to ensure close and accurate work. But when these plans are to be had the surveyor can, if he chooses, after laying down the main lines in the field and plotting them, fill in from the plans, instead of from actual measurements: consequently whatever errors exist in the one are perpetuated in the latter. However desirous of turning out perfectly good work, yet a professional man must cut his cloth according to his measure. If his employers are too parsimonious to allow him a sum which would permit him to do justice to them and to himself, then they are to blame and not he if they discover that they only get what they paid for; that is, an inferior article. A thoroughly accurate plan of a town and district is worth any sum in reason. An inaccurate one is not worth the paper upon which it is plotted, and entails, in the long run, more expense than would have sufficed in the first instance to pay for it half a dozen times over, not to mention the trouble and uncertainly it is constantly giving rise to. So long as local authorities continue to pay for professional services on the inadequate and niggardly scale lately brought before the public, so long may they expect their plans to be a combination of accuracies and inaccuracies, and to consist of partially *bonâ fide* and partially copied work, instead of genuine examples of triangulations, measurements, and dimensions plotted from actual field notes.

T. C.

COLOUR IN STAINED GLASS.

Sir,—The eclectic issues raised by Mr. Sharpe's original letters on this subject are of importance, and undoubtedly deserve the attention of all, both patrons and painters, who wish to maintain artistic glass-painting, and prevent its practice—as is now too frequently the case—simply as a mechanical vehicle of colour.

The entire exclusion of figure-subjects, and the employment of geometrical and conventional forms are contentions on which I do not now enter, beyond saying that these conceptions have not as yet been developed in anything like the extent and beauty of which they are capable.

Of old works there are few remaining, if, indeed, the mode ever largely prevailed. Mr. Sharpe is apparently narrowed to two or three extant instances for his illustrations, and only one of these is of any scale or completeness. Most modern attempts in this direction are simply execrable, and have been chiefly, it would seem, carried out under unfavourable influences.

Conventicles have, in our time, afforded the main field for these essays, where dislike of subject-windows, from their show and treatment, has ruled their exclusion; or limited means have compelled patrons to be content with simpler effects. Under these circumstances it is not to be presumed that we should find much artistic feeling fostered or expressed. Recent examples in the severe form, of any worth, are so rare, that one may be allowed to notice a rather meritorious work just finished at Holy Trinity Church (by the Triangle), Hoxton. It is a rose-window of considerable sphere and well-apportioned tracery filled with glass in patterns, the whole of which are described *by the lead-work*, the glass being "pot-metal" exclusively; as means would only allow a spare employment of decorative colour. The example is, I think, at the present time, of special interest, as showing what may be done in a truthful and artistic manner in the direction Mr. Sharpe has proposed. And it certainly indicates how wide a scope there lies in the direction for studious design and honest execution. The inverted saints and other abnormal fillings so often seen in "rosaces" or circular-windows, must assuredly yield in any æsthetic comparison with a well-designed pane in the treatment now contended for. The example cited was, I believe, executed by Messrs. Pitman, by whom the church has recently been polychromed.

J. J.

ST. MARGARET'S (R.C.) CHURCH, DUNFERMLINE.

This church, designed by Mr. R. Thornton Shiells, of Edinburgh, is of a style not usually adopted in the present day, but it was so prescribed to the architect. The plan consists of a nave, without aisles, terminated by a semicircular apse, upon each side of which is projected a semicircular chapel. Above the doorway is an organ gallery. The area is lighted by coupled windows, arched and divided by a shaft with foliated cap; between each couplet is a fluted Corinthian pilaster, supporting a dentilled cornice, from which springs a semicircular coffered ceiling. The floor is to be unencumbered by pews; chairs are to be provided for the worshippers. Pilasters, entablature, and elliptical pediment are features of the exterior. A bas-relief above the doorway represents the landing of the saint at St. Margaret's Hope, near the ancient city of Dunfermline. The interior, which measures 70 ft. by 30 ft., and to the apex of the roof 36 ft., is ultimately to be decorated in colour, but this and the furnishings are not yet settled. Operations are to commence forthwith. The architect should try to persuade his client to let him submit a design of another character.

THE MAIN DRAINAGE OF DUBLIN.

Sir,—In your last impression you have a short leader on the proposed main drainage of Dublin, a work tardily resolved on, but most urgently needed, owing to the almost incredibly filthy condition in which the river Liffey has long been suffered to progress in a cumulative ratio.

The proposed plan is a very good one, but your article naturally complains of the apparent folly of the intention to cast all the valuable sewage of Dublin into the sea near the mouth of the harbour, where it is supposed by the writer much of the foul matter may be washed back to Dublin by the flood-tides.

While I demur to this assumption, and believe, from an intimate knowledge of the locality, that there is little to fear from returning sewage, I beg to say that there is no difficulty whatever in carrying out an excellent and cheap scheme for the utilisation of the Dublin sewage, in the immediate vicinity of the proposed outfall into the sea. No city that I know, in fact, has such obvious and convenient facilities for the purpose in the great strand at Clontarf, called the North Bull. There a large island or peninsula can be formed, of from 1,500 to 2,000 acres, surrounded wholly or partially by the sea, protected by very moderate embankments, and consisting of sand mixed with a little mud, just suited to sewage irrigation. A large portion of this waste is already over high-water mark, and the rest is slowly warping up.

The proposed outfall will skirt the edge of this

suggested reclamation and literally there is little to do (beyond making the embankments) but to let the sewage flow over the land, instead of pouring into the sea.

This plan has been for some years put forward by me, and has been explained to the Dublin authorities, who have been only deterred from taking it up by threats of opposition from proprietors on the neighbouring shores of Clontarf and Howth. The apprehensions of these proprietors, I feel convinced, are groundless. A belt of salt water of several hundred yards in width would interpose between them and the nearest point of the proposed sewage farm, while the porous nature of the land to be enclosed would prevent all stagnation, and the growing crops alone would take up all sewage that did not sink into the sand.

In such a situation, I believe a very good profit could be made on the outlay, the sewage being at the threshold of the farm without expense.

In the metropolis sewage utilisation scheme for London, to which I was engineer, and which was suspended for want of public support, a culvert of over 40 miles in length and 10 ft. diameter, and costing one million sterling, was necessary to lead the sewage to the Maplin Sands, where a farm of 12,000 acres was to be made to utilise the sewage upon. How vastly better situated Dublin is in this matter will at once be seen from the above statements by any one who can, like myself, add C.E. to his name.

G. W. Hemans.

TAR PAVEMENT.

Sir,—I am afraid the specification for footways in your last number is too expensive for general use; so I annex one of pavement of which I have laid a lineal mile in this town (Bury St. Edmund's), this year, at a cost of 1s. 3d. per superficial yard. I may add that the price varies with the quantity laid at one time, and the cost of material in the neighbourhood.

Hot breeze from gas-works, 3 bushels.
Hot shingle passed through a ¾-in. mesh, 1 bushel.
Hot tar, 1 gallon.

Mix the whole thoroughly, and pass through a ¾-in. mesh, and part through a $\frac{3}{16}$-in. mesh. Lay 2 in. thick of the roughest material, and roll it; then ½ in. of the second and ¼ in. of the finest. Then sprinkle fine white shingle, and roll well with a light and then with a heavy roller. The proportions have to be varied according to the quality of the breeze and shingle, and the weather during which the pavement is laid.

Thos. H. Methven.

"HOUSEMAIDS' KNEE."

Cannot something be done, by the influence of the *Builder*, to abolish the common practice of housemaids and general servants going upon their knees to clean doorsteps? Some houses, in the suburbs of London, have as many as ten steps, besides landings and curbs. These it is the custom to keep scrupulously whitened, and this is generally performed, in all weathers, by female servants. What necessity is there for so much use of hearthstone? In some country towns, Bath for example, a whitened doorstep is rarely seen, yet attention is given to all necessary cleanliness. If, to please Londoners, the steps must be whitened, let it be done with a brush, or mop, or some appliance by which it can be performed in a standing instead of a kneeling position, and with some other material than hearthstone, but equally or more suitable. This is a subject which is surely worthy the consideration of architects and builders, with the view of introducing improvements, by example in their own households, and for general adoption by housekeepers. It relates to cleaning certain portions of their own works. The question may be carried still further, and it may be asked, what necessity exists for kneeling at all in floor-cleaning?

Mr. Richard Davy, in a communication to the *Medical Journal*, in reference to "Housemaids' Knee," remarks, that during the past year twenty-one cases of this affection have been registered as in-patients at the Westminster Hospital (one man and twenty girls), demonstrating that some mechanical improvements are needed in the common scrubber's necessaries. He maintains that it is an unnecessary and quite a cruel custom that servants should subject their knees to the cold pavement or damp floor, and their bursæ to continued pressure, to ensure a clean doorstep, a bright hearth, or a polished floor. Flunkeys who, of course have too much self-pride to knuckle down and clean their halls, use the American squeegg-brush, or a long-handled mop; the women in Holland clean their steps with an appliance combining the brush and wiper; the Parisian garçon waxes his floor with a footbrush, and so on. Let, therefore, our poor English girls be supplied with brushes and wipers, that can be used in the erect posture. Then our housemaids will be eased of a frequent and painful, if not a dangerous affection; our hospitals will be provided with more empty beds; and employers will be spared the inconvenience of sending their broken-kneed drudges into the wards of the nearest charitable institution.

Let me add the suggestion that all those of your readers who are acquainted with really good and practical means of accomplishing the above objects, should make the same generally known.

A. S. C. B.

"CLAUSES OF CONTRACT."

We have received, at the moment of going to press, a communication on this subject from the Institute of Architects, expressing surprise that the "Headings for Conditions of Contract" should have been printed "without authority," and "*minus* the preamble, which, by common consent, was to be prefixed to the Conditions in question," copy of which is now sent. The document came to us from two separate quarters, and, so far as we are concerned, no other authority was needed. It was not accompanied by the Preamble,—which we now print.

"GENERAL HEADINGS FOR CLAUSES OF CONTRACT.

MEMORANDUM.

[*Approved at a Meeting of Council held on the 1st August*, 1870.]

The Council have had under consideration certain headings of clauses for contracts between builders and their employers, as proposed by the Builders' Society, and have referred them for examination to a committee. The Council, upon the report of this committee, submitted to the Builders' Society modifications, which they thought necessary to make in the headings suggested by the Builders' Society, so as to render them acceptable to the architect and his employer.

The attention given by the Committee and Council has been limited to the clauses submitted to their consideration by the Builders' Society; but, of course, other clauses are necessary to establish fully all the relative responsibilities of the employer and employed.

At the same time it is to be observed, that the Council cannot pretend to bind its members to the adoption of any headings of clauses of contract, which the Council may think either reasonable or expedient; for, in such a legal document, the employer must rely wholly on the opinion of his architect and legal adviser, both as to specific heads and matters of the contract and as to the form in which they should be drawn, in order to give them the proper legal efficacy.

The responsibilities of the contract lie between the employer and contractor alone; the architect being merely the adviser of the employer, and acting as equitable medium between the two. Any responsibilities, which he may professionally have, rest between him and his employer. Consequently, all obligations in the contract lie between the contracting parties only.

The absolute control of the execution of the work, in all its particulars, must rest with the architect, who is expected to exercise a just and fair judgment between the two parties; though a reference is but equitable, if desired, in questions as to the quantity, extent, or value of extras and omissions, alterations or additions, subject to any special provisions in the contract on this head, as to written authority, periodical delivery of accounts, &c., &c.

Thomas L. Donaldson, } Hon. Secs."
John P. Seddon, }

PLANTING THE THAMES EMBANKMENTS.

At last week's meeting of the Board of Works the following report from the Parks, Commons, and Open Spaces Committee as to planting the Albert Embankment with plane trees, and the surplus land laid out and planted in a similar manner to the Victoria Embankment, was adopted:—

"Your Committee have proceeded upon your resolution of the 30th ult., directing them to take the necessary steps for planting the Albert Embankment this autumn, and to report thereon at an early date. It will be remembered that on the 29th of July last the Board had before them a report by the Works and General Purposes Committee, from which it appeared that certain of the plots of spare land on the Albert Embankment were proposed to be laid out and planted. Your committee have had before them a report by Mr. M'Kenzie, in which he recommends that 184 plane trees should be planted along the Embankment, and at certain other points referred to by him, and that the spaces marked on the plan accompanying his report should be enclosed with an iron fence of the same pattern as the one for the Victoria Embankment, and planted almost exclusively with deciduous trees and shrubs. The total cost, including all materials, shrubs, labour, and planting, is estimated, your committee find, at about 3,000*l.*, and they are of opinion that this is a reasonable amount, and that the necessary works should be carried out. They recommend this course for adoption, and that it be referred back to them to take all necessary steps for the purpose."

THE PREMIUMS OF THE INSTITUTION OF CIVIL ENGINEERS.

Amongst the subjects for approved original communications on which the Council of the Institution of Civil Engineers will be prepared to award premiums arising out of special funds devoted for the purpose, are the following:—

1. On the Strength and Resistance of Materials, practically and experimentally considered.
2. On the Theory and Practical Design of Retaining Walls.
3. On Land-slips, with the best Means of preventing or arresting them, with Examples.
4. On the Principles to be observed in laying out Lines of Railway through Mountainous Countries, with Examples of their Application in the Alps, the Pyrenees, the Indian Ghâts, the Rocky Mountains of America, and similar Localities.
5. On Peculiarities in the Systems of Construction adopted for Railways in different Countries.
6. On the Principles which should be observed in laying out the Streets and Thoroughfares of Towns, or of the successive Extensions of large Towns and Cities.
7. On the most suitable Materials for, and the best Mode of Formation of, the Surfaces of the Streets of large Towns.
8. On the Advantages and Disadvantages of Subways, for Gas and Water Mains, and for other similar purposes.
9. Accounts of existing Waterworks; including the Sources of Supply, a Description of the different Modes of collecting and filtering Water, the Distribution to the Consumers, and the general practical Results.
10. On the Principles applicable to the Drainage of Towns, and the Disposal of the Sewage.
11. On the Employment of Steam Power in Agriculture.
12. On the Theory and Practice of the Modern Methods of Warming and Ventilating large Buildings.
13. On the Supply of Gaseous Fuel in Towns for Heating Purposes.

HALIFAX BENEFIT BUILDING SOCIETY'S OFFICES COMPETITION.

Sir,—As a competitor in the above-named competition (the drawings for which were sent in in February last, under motto), will you allow me the privilege to suggest to the committee, through your columns, the desirability of advertising the rotation in which the respective designs will be taken until one is found which the author can carry out for the amount of his estimated cost; and, if the designs are numerous, of returning a number of those lowest on the list to their authors? My reason for suggesting this is, that during the eight months which have elapsed since the designs were sent in, all the information we have obtained has been through a letter in your columns nearly three months ago, in reply to a previous letter of inquiry, by which we learnt that a design had been chosen, but the author could not carry it out for the amount of his estimate, and that a second design had then been chosen, and the author placed upon his trial on the point in which the first failed. Of course the principle is all that can be required, but the means of carrying it out do not seem to be quite so well considered.

Suspense.

SASHES.

Sir,—In a recent impression of the *Builder*, I note, under the above heading, the remarks of a "Working Man," who states, "He has seen in the Museum of Patents, South Kensington, some sashes by a Mr. Bullivant, which he approves." During the building of a house for myself, I brought consideration to bear upon every appliance I thought to be necessary to the health and comfort of my family. Although I may have made many mistakes (which my friends may avoid), I have no reason to regret having adopted Mr. Bullivant's sashes. They are free from all the objections urged against the old-fashioned sliding sashes. They are perfectly air-tight, work easily, are free from all rattle, and they also possess that long-desired advantage—simplicity of removal (from the inside), for cleaning or other purposes. Were these sashes generally adopted, many distressing accidents would be avoided.

George Jennings.

MAN THE BOATS.

The complications of Mr. Ambrose's apparatus seem to me to condemn itself. I will endeavour to describe Cooper's, premising that I never saw it but once, and that about fourteen years ago. Boats are commonly hung over a ship's side by a pair of davits, which are simply two cranes. A ring-bolt is fixed through the fore-foot, and another through the stern-post of the boat with a single-block permanently strapped on each *ring*. A stout rope pendant is fast to each davit-head, rove through the blocks, and continued round a roller (one *over*, the other *under*), which is fixed across the boat amidships, the ends being simply tucked through a hole at each end of the roller. Another rope is fast to a staple on the roller, and lies coiled away in the stern-sheets. When ready for lowering, the boat's crew sit in their places with the oars tossed ready to drop in the water, the rudder is shipped for use, the pendants are wound up on the roller, the weight of the boat being dependent on them, and the third rope, which keeps the roller from revolving, is taken round a post fixed to the after-thwart, and held by the coxswain. At the word the coxswain eases his rope, the roller revolves and the pendants unwind, the lowering rope being wound up turn for turn on the roller as the pendants wind off. As soon as the boat takes the water, the coxswain throws the turn of the rope off the post, the roller revolves freely, the pendants unwind by the weight of the boat, and the ends (not being fastened) leave the roller, pass through the blocks, and the boat is clear of the ship. The crew drop their oars into the water, and the roller is taken out

of the crutches in which it worked, and stowed]away. For hoisting the boat, a third and larger davit is provided, fixed midway between the other two, to which is attached the ordinary double or treble purchase tackle. A rope sling is hooked by four legs to each bow and quarter, the large eye from which the legs radiate being hooked to the lower block of the tackle. The danger in hoisting is considerably reduced by the boat being hung from the centre, and the power employed being concentrated. The danger and also labour might be further lessened by taking the fall from the davit head straight up to the mast-head, and down to a crab winch, or in a steamer through the deck to a drum in the engine-room. I describe from memory, but trust I am understood.

F. T. Mullett.

[Here the discussion may end.]

STEAM ROLLER WORK.

A report on work performed by the steam-roller in Marylebone has been made by Mr. Greenwell, the chief surveyor. The roller was hired from Messrs. Aveling & Porter for a month on trial. It was a fifteen-ton one. The report says:—"The total number of yards rolled in thirty days was 23,145, and the expense of hire of roller, fuel, and water, 71*l.* 17*s.* 11*d.*, which, after deducting for time expended for using spikes, shows the cost of rolling to have been 2·67 farthings per superficial yard. The expense would be reduced by purchase, at least 30 per cent. The price varied considerably in the several streets, ranging from 1·04 farthing in Devonshire-street, where a considerable length was open with few hinderances and little traffic, to 4·08 farthings in Paddington-street, where only a short length was open with interruptions by traffic, and the material much cut up by heavy vehicles. From data as to the cost of rolling by horse labour, I find the average of a considerable number of streets to be a little under two farthings per yard, and more recently York-place and Townshend-road cost respectively 2·39 farthings and 3·49 farthings per yard. This shows horse-rolling to be nominally cheaper; but the vast superiority in every way, now almost universally acknowledged, of the work done by the steam roller, will prove the latter to be far the more economical. Less labour is required by sweepers, and less mud is removed by their operations than from the old system of coating macadamised roads. During the night-rolling which was introduced into Gloucester-place and Baker-street, the inhabitants of the locality who noticed a rough and almost impassable way in the evening, were agreeably astonished to find a road ready for their use in the morning.

ROYAL ARCHITECTURAL MUSEUM.

The museum is re-opened, and convenience for study afforded, both daily from 10 to 4, and on the evenings of Tuesday, Thursday, and Saturday, from 7 to 9.30. Those who may care for systematic teaching in the various branches of architectural art may carry out their wishes at a trifling expense by joining the classes now formed in one of the rooms of the museum. We are informed officially, that during the recess the collection has been partially re-arranged, and the upper gallery has been railed round, and access to it obtained by a permanent staircase. This gallery will now be occupied by a collection of casts from Amiens and other places, and, it is hoped, by a selection from the Royal Academy. The catalogue will then be proceeded with, and a copy sent to each member. From this architects will be able to point out to their pupils the particular objects they may wish them to study without themselves visiting the museum, and the selections of casts of which copies are required, and for supplying which arrangements are now complete, will thus be facilitated. New subscribers are earnestly invited.

CHURCH-BUILDING NEWS.

Rickmansworth.—The first stone of a district church at Croxley Green, in the parish of Rickmansworth, has been laid by Lord Ebury. The site is a triangular piece of ground, shaped by three roads. The architecture is Early English. The nave will be 63 ft. long, 25 ft. wide, and 40 ft. high; the chancel, 30 ft. long and 20 ft. wide. There will be a reredos forming an arcade running along the east wall; on the north side the vestry and organ-chamber; and on the south a porch. The tracings of the doors and windows will be of Doulting stone, and the roof of Staffordshire tiles, diaper pattern. A small tower will be surmounted with a spire, covered with Staffordshire tiles. It will be 83 ft. high, and is designed for bells. The contract is taken for 2,318*l*, by Mr. S. Clark, of Bath. Mr. John Norton, of London, is the architect. The total sum already subscribed is 2,200*l*., and about 500*l*. more are required.

Heaton Norris.—The alteration and enlargement of St. Thomas's Church, Heaton Norris, have been effected, and the edifice re-opened. Two hundred additional sittings have been provided; the whole effect of the exterior and much of the interior of the church altered; and many necessary repairs effected, for between 900*l*. to 1,000*l*. Externally, the sharply-pointed Gothic has been brought into harmony with the nave, and the whole made to look like one tolerably harmonious whole. Additional sittings are obtained in the corners between the transepts and the shallow chancel. The old transepts have had new roofs, new timbers, and new slating. The old roofs were much out of repair, and the ceilings over the galleries came down so low that they could easily be touched with the hand. The new roofs are open to the top, and the gallery seats are consequently much more airy and comfortable. The north and south transepts are gabled, and have, externally, a dignity which before was wanting. The new chancel aisles are also gabled, and a few buttresses added where required. The old bulbous-looking belfry, in the last stage of dilapidation, is replaced by a new and larger turret, covered with oak shingle, and surmounted by a cross and weathercock. It is divided and arranged to contain two bells: one cast by Mears, of London, is already hung. A large gabled porch has been built over the north door of the nave, and another over the door of the north transept. The two west doors have wooden gabled projecting roofs over them. All these features have done something towards giving church-like effect to a building which, three months ago, had not a vestige of either. A greater difficulty remained with the old round-headed windows. These have now all been filled with stone tracery, mullions, and jambs of a kind designed in detail to suit the old round-headed frames, and yet such as would consist duly with the chancel of a few years ago. The new pews are of a more comfortable shape than the old, and places for hats, &c., have been contrived under the seats. The low, flat ceiling of the nave, opposite to and joining the transept, has been removed, and an open roof substituted. The glass has been taken from the old window openings between transepts and chancel aisles, and the space filled with wrought-iron ornamental grilles or scroll-work. The contractor was Mr. T. Darnbrough, and the architects were Messrs. Medland & Henry Taylor, of Manchester.

Torrington.—The church here has been restored and re-opened. Upwards of twelve months ago it was closed to undergo the necessary work of restoration. Mr. Ewan Christian, of London, architect, was called in professionally, and he prepared the plans and drawings. The sole contractors engaged were Mr. Pape and Mr. Watson, both of Beverley, the former to carry out all the masonry, the latter to complete the joiners' work. Mr. W. R. Dick was clerk of the works. On commencing operations the first duty was to clear out the internal fittings of the edifice, which were of the old-fashioned and inconvenient sort. The walls were attended to where required, and pointed throughout. The tower needed restoration. The repairing of it is still going on. The principal work in connexion with the tower is the restoration of the embattled parapet, and providing it with eight carved pinnacles. The south wall of the nave is of Saxon work, having in a fine state of preservation herringbone masonry, which has not been interfered with. To this part of the church has been added a south aisle, which is approached through an arcade, in order to correspond with the north aisle on the opposite side, which is divided from the central part of the nave by Norman arches. It is supposed that on the ground where the new south aisle is erected there formerly stood an ancient chantry. The roofs are entirely new; that covering in the chancel is Pointed Gothic in design, with moulded ribs and panels and carved bosses. The nave and aisle roofs are open-timbered and high-pitched, the timber being stained and varnished, and the whole covered with Westmoreland slates. A new porch has been built at the south end of the nave immediately adjoining the tower. The flooring of the edifice has been entirely relaid in concrete; that of the nave is of dressed stone, and that of the chancel is laid with Minton's coloured tiles, intermingled with encaustic tiles within the sacrarium. The seats are of deal and open, having square ends pierced with quatrefoils and other ecclesiastical devices, and book-boards are also provided. In the winter season the church will be warmed with hot air by Mr. Haden, of Trowbridge. The windows are filled in with plain glass. The new one in the south aisle is of three lights, with quatrefoil heads. The east window is of three lights, and is supplied with stained glass by Hardman, of Birmingham. The centre light represents the Resurrection; the side lights are illustrative of the Good Samaritan and Dorcas distributing raiment to the poor. The church originally could seat 230, but by the new style of pewing adopted in the restoration, the sittings will accommodate 320, or an addition of 90. The expense incurred by the restoration will be about 2,200*l*.

Tamworth.—The foundation-stone of a new church has been laid at the little hamlet of Dosthill, in the parish of Kingsbury. The new edifice cost about 850*l*. The design was by Mr. Holmes, of Birmingham and Burton-on-Trent, architect. The site was given by the vicar of the parish, the Rev. C. T. Cary. The building will be of stone, and is dedicated to St. Paul. The old chapel will be used as a Sunday-school.

Kniveton.—The old church here has been restored, if we may so term it. Portions of the edifice are of the Norman period. A part of the east wall, which was in a very dilapidated state, has been rebuilt, and nearly all the walls repointed, and at the corner of each coigns have been placed. The whole of the exterior has been recoloured. Round the eaves of the roof troughing has been placed, for draining into an adjoining brook. The steeple has been repaired, and the nave re-gilt. The porch has been renovated. Two iron gates have been placed in the entrance, the floor re-paved, and the rough stone seats removed and replaced with oak benches. In the interior of the edifice the aisle has been newly paved throughout, and plain open seats have taken the place of the old-fashioned pews. The old pews have been removed from the chancel, and stalls for the clergy and the choir have been substituted. The old Communion-rails have been removed from the chancel, and new ones, composed of iron and oak, have taken their place. The ironwork has been painted blue: the ends, of the forms of the *fleur de lis*, are gilded. The ceiling of the chancel has been coloured, and dotted with gold stars. In the nave the ceiling has been cleaned, and the beams have been stained dark oak colour. The front of the old gallery has been lowered, and open seats have been substituted for the old pews. The bottom of the tower, which was formerly used as a coal-cellar, has been converted into a vestry. Previously there was no vestry, the clergyman being obliged to robe in the presence of the congregation. For the evening service the church is lighted with three-branched candlesticks, placed at the end of every other seat. The east and also two of the chancel windows have been re-glazed. The churchyard is in a very bad state. The ironwork of the alterations is the work of Mr. G. Webster, an inhabitant of the village, and we believe the whole of the other work has likewise been executed by Kniveton artizans.

Thorndon.—The parish church of Thorndon All Saints has been re-opened. The flint work of the west wall has been re-pointed. Some shabby patches of brickwork on the north side still call for removal. The roof has been restored as a wagon-roof of the Decorated period. A deep moulded cornice, with ball-flower, and other ornaments in the principal hollow, marks the edge of the wall-plate from which the spars spring. The timber used is yellow deal, varnished. In restoring the roof the architect followed the pattern of the old one, of which about 20 ft. remained in its original form at the west end of the nave. At the point where the chancel commences is a semicircular rib, springing from stone corbels representing angels, and this is all that breaks the uniformity of the appearance of the roof from east to west. New benches have been made throughout the church. They are all of oak. The old poppy-heads were preserved, and used as far as possible, and the new ones were carved to resemble them. The west end has a four-light Decorated window: the mullions had been replaced with cast-iron bars, all of which have been restored with stone. The reredos is new. It is a carving in oak in three compartments, or three canopied niches. The style followed in the details is that of the Decorated period. The north niche has the *Agnus Dei* carved on a diapered ground, and the one on the south side the pelican. The centre and

largest recess is filled with a representation of the Lord's Supper. This work was designed by the architect, and the carving was executed by M. Abacos, of Louvain. The reredos was presented to the church by Mr. Bridges, a relative of the rector's. The church is lighted at night by a series of standards, each of which holds three candles. These are placed in the nave, on the backs of the benches, and in the chancel there are other candles arranged in groups on each side on coronal burners. An apparatus for warming, by Gedney, of East Dereham, is fixed beneath the floor of the nave. The total cost of the works recently completed is about 1,100*l*. Mr. R. M. Phipson was the architect.

Thorpe Morieux.—The church here has been reopened, having undergone considerable repairs and improvements. The walls were in part ruinous and declining from the perpendicular, the roofs were almost unsafe, the fittings discreditable, the area was blocked up by high pews and a western gallery, and altogether it was just falling into decay. Contracts were entered into for the restoration, at a cost of nearly 1,500*l*., from designs by Mr. J. D. Wyatt, architect. Mr. H. W. Andrews, of Bury, undertook the contract for the general carcass. Mr. Darkin, of Bury, was clerk of the works, and executed the pulpit, screen, and altar-rail and table. The tiles for the floor were from Mr. Godwin, of Hereford; the new stained-glass windows were by O'Connor; the brass lectern was supplied by Hart & Sons, London; and the warming apparatus (hot air) by Sidney, of Dereham. The stone carving was by Farrants, of Bury. The church is of three different styles of architecture, which are more distinctly marked than in many buildings. The chancel roof is a wagon panelled one, that of the nave is open-timbered. All the walls were attended to and partly rebuilt, the rubble and stone quoins shown externally, and the walls re-plastered inside. The church is new floored, different patterns being worked in in the sacrarium. Several slabs of the Harrison family have been preserved *in situ* as far as possible. The church is built on a slope downwards from the tower, so that the seats in that part appear when looked at from the east end arranged as a graduated gallery. The new seats have finials of quatrefoils and flowers. The chancel seats have poppy-heads. Some of the fragments of carving found in different places have been worked into a dwarf rood-screen. It is intended as money shall come in to stencil the walls and introduce paintings and colours.

Cardiff.—The completion of the spire of Canton Church has been celebrated. The church, itself was built about ten years ago, but the funds were not sufficient to complete the chancel and the chancel arch was bricked up, service being carried on in the nave only. About two years ago an effort was made to complete the edifice, by the erection of a chancel, surmounted with a tower and spire, and externally this work has been completed, from a design by Mr. W. P. James, architect, the original idea being to place the spire and tower over the western and not the eastern portion of the edifice. The work has been carried out in conformity with the original style of the church, which is Norman, the tower and spire being built with Newbridge stone and Bath stone dressing.

Lelant.—The ancient church of Lelant, which is situated on the edge of the sandy towans which overlook Hayle, has been reopened for divine worship, after having undergone partial restoration. The church, which is very old, some part of it having been built in the twelfth century, had become much dilapidated. The work of restoration was undertaken by Messrs. Bone & Son, of Liskeard, the architect being Mr. John Sedding, of Bristol and Penzance. The interior of the church first demanded attention, although some parts of the roof were in as sorry a plight. The centre pews have been removed and replaced by lower and open ones of oak. The chancel has been much improved, the flooring having been laid with tiles, and new screens put up. The pulpit, which was a clumsy, old-fashioned structure, has been removed for the time. Several of the old pews still remain. Up to the present time 220*l*. have been expended on the work. The other necessary repairs will be completed as soon as the funds are forthcoming.

Strasbourg Cathedral.—Not simply the restoration, but the completion of the cathedral is already being discussed. On the restoration of peace it will probably be attempted.

Books Received.

Polychromatic Masterpieces of Monumental Art in Italy from the Fifth to the Sixteenth Century. Represented by Twelve Perspective Views in Coloured Plates by Henry Köhler, Royal Commissioner for Art-building and Teacher of Architecture in the Polytechnic School at Hanover.

This work, the publication of which has been commenced by Mr. Baumgaertner in Leipsic, promises to be remarkable. Improvements in chromo-lithography have given us many fine works, such as "L'Architecture Polychrome chez les Grecs," by Hittorff; "The Grammar of Ornament," by Owen Jones; "Specimens of Ornamental Art," by Gruner; "Ornaments and Painting from Pompeii," by Zahn, and the "Italian Frescoes" published by the Arundel Society. But, as the publisher points out, we have no work showing complete buildings or apartments, giving the entire effect characterising them. The book, of which the first part is before us, will, as a first instalment, include twelve artistically-finished perspective and, at the same time, coloured representations of the polychromatic masterpieces of Italy, which justly enjoy the admiration and universal acknowledgment of the civilised world.

The first number, containing plates representing the interior of the Camera della Segnatura and the interior of St. Peter's at Rome, executed in the *ateliers* of Messrs. W. Loeillot and Winckelmann & Sons, in Berlin, is before us, with letter-press in German, French, English, and Italian, giving a concise explanation of the plates. On completion of the numbers, the work is to be furnished with an introduction in the same four languages, setting forth in a critical manner the polychromatic treatment of the Italian monuments in its historical and æsthetical development.

The second number is to contain plates representing the Sistine Chapel and Stanza of Heliodorus, and is to appear in the course of 1870. We shall be able to speak more at length when the work is further advanced. Suffice it at present to say that the two views issued are admirable specimens of the art, careful in detail, and exquisite in tone.

We understand copies can be seen and purchased on application to Mr. T. W. Maynard, at the rooms of the Arundel Society.

Ardfert Cathedral, in the County of Kerry. Measured, drawn, and lithographed by Arthur Hill, B.E., Architect, 22, George-street, Cork. 1870.

In May of the present year the Institute of British Architects awarded a medal of merit to Mr. Arthur Hill for measured drawings of several ancient buildings in Ireland, submitted in accordance with the regulations of their annually-offered prizes; and these, under the general heading, "Ancient Irish Architecture," Mr. Hill proposes to publish. Ardfert Cathedral, now before us, is the first, and the Church at Kilmalkedar, near Dingle, and that of Templenaboe, Ardfert, will follow. The illustrations of Ardfert Cathedral comprise a series of ten plates, 17 in. by 13½ in., lithographed by the author; six photographs, and descriptive letter-press, illustrating the architecture and present condition of the building. The main part of it is of the thirteenth century, with the west door of a previously-erected building, probably twelfth century. The door-head is semicircular, and has a rougher discharging arch above it, with key-stone, which takes a pointed form, and may have been put in afterwards. The choir is lighted by a lofty triplet at east end, and a range of nine lancet-headed windows on the south side. The drawings are executed with firmness and precision, and the photographs in the copy before us are particularly good. We wish Mr. Hill success in his undertaking.

Miscellanea.

Laying the Foundation-stone of a New Masonic Hall in Newcastle-on-Tyne.—A suitable site having been obtained in Maple-street, plans for the building were prepared by Mr. J. Johnstone, architect, and a contract for the work entered into with Mr. W. Foggin. The building is now being proceeded with, and the foundation-stone has been laid with Masonic ceremony.

The Metropolis Valuation Act.—A document, issued from the Home Office, has been received by the local authorities throughout the metropolis, announcing the appointment of the General Assessment Sessions, under the provisions of the Metropolis Valuation Act, in Middlesex, in the City of London, and in those portions of Surrey and Kent enumerated as being within the metropolitan area. Also the orders and regulations of Court naming the respective persons appointed to hear appeals, fixing the tables of fees payable by appellants, &c. At a Court held under the presidency of Sir W. H. Bodkin, it is ordered that in every appeal to a special sessions from a decision of an assessment committee, the appellant with one security is compelled to enter into recognisances in the sum of 20*l*. before a justice of his district, for the due prosecution of the appeal and payment of costs ordered by the Court, but it is not to apply to any assessment committee, overseer, or surveyor of taxes. On every appeal from either assessment committee or special sessions to the "Assessment Sessions," every appellant with his securities must give at least 50*l*. recognisances for expenses and costs. All appeals to be entered by petition to the "Assessment Sessions" by the 14th January following the final approval of a valuation list by an assessment committee. The list of fees payable is formidable, especially as regards the "Assessment Sessions." Indeed, so exorbitant are the fees for hearing, &c., that it is scarcely likely many of the ratepayers will carry their grievances to so high and expensive a tribunal as the "Assessment Sessions," but will content themselves with the decision of the special sessions or assessment committee.

The New Workhouse, Upper Holloway. The new workhouse now in course of erection in Upper Holloway, for the parish of Islington, is destined to give the guardians a little more trouble than they had bargained for. It is generally admitted the building ought to have been finished long ago. Why it has not yet been completed and handed over to the guardians for occupation is a question which the indignant ratepayers would be very glad to have answered. But there seems very little chance of their being informed of the cause. It is well known that serious differences exist between the architect and contractor. Recently, whenever the solicitor or architect appears before the Board with reference to the building, the guardians resolve themselves into committee, and thus, in excluding the reporters, prevent an anxious public from knowing what is being done. Some ugly rumours are already afloat that the cost of the building will largely exceed the estimate, and that possession will not be obtained without expensive litigation.

An Opera House for Wolverhampton.—The people of Wolverhampton have now an opera house. This has come about by the spacious and convenient room of the Exchange having been adapted by scenic erections to the purposes of theatrical representation. Mr. Hand, the secretary of the Exchange Company, has been joined by Mr. Leonard, decorator, of Chapel Ash, and they two are making the venture. The scenic arrangements are those of Mr. Leonard himself, many years decorator and scene-painter at the Dublin Theatre.

Fire at the Gaiety Restaurant.—The other evening a cloud of smoke issuing into the Strand from some cellars under the wine department of the Gaiety Restaurant announced that a fire had broken out below. It was soon found that some straw and packing-cases had become ignited; but, as it was known that there was nothing of an inflammable nature in the construction of the lower story, there was no fear that either the upper part or the theatre was in danger. A similar alarm was caused by fire in these cellars some time ago.

Demolition of the Old Borough Gaol Hull.—The chairman of the local Gaol Committee reports that there have been taken up from the foundations of the gaol 555,000 bricks, which have been sold at 11s. per thousand, nearly double the money they cost taking up and dressing. At the time the superstructure was being removed, it was suggested that the foundations would not be worth removing, but Mr. Symons (amid the laughter of the committee) said he believed there were nearly as many bricks underground as above, and suggested that they should be taken up. Mr. Symons may be congratulated on making so profitable a suggestion.

Tron Church, Edinburgh.—A large stained glass window, subscribed for by a few of the leading members of the congregation, has just been fitted up in this church. It is a triplet tracery window, divided by a transom, and contains six illustrations—the Annunciation to the Shepherds, the Worshipping of the Wise Men, the Presentation in the Temple, Christ among the Doctors, the Baptism, and the Sermon on the Mount. The subjects are all executed in the Mosaic style of glass-painting. The centre light contains the lamb and banner, and the side lights have angels in the attitude of adoration. The whole has been designed and executed by the Messrs. Ballantine. The window, which will cost about 270*l.*, is on the east side of the church, and looks out upon the South Bridge. There is some likelihood of the window on the other side being also filled up soon.

Settling down of a Steamer on the Stocks.—At Low Walker, near Newcastle-upon-Tyne, a number of riveters and painters were busily engaged in putting the finishing touches upon a small screw steam-vessel, about 500 tons burthen. Several of the riveters who were working at the hull incautiously removed too many of the blocks on which she stood in order to facilitate their operations, when she started forward as if being launched, the shores sprang away, and owing to the inclination on which vessels are built, she settled to the earth, a distance of about 3 ft., and so quickly and easily that a casual passer-by would not have observed that the vessel was in other than its proper position,—but crushing in its descent a number of the workmen. Four men were killed on the spot, and nine dangerously injured, besides four slightly injured. Such was the force with which the vessel fell, that is crushed those it killed into the earth, from which they had afterwards to be dug by means of spades and other implements.

The Alexandra Palace, Muswell-hill.—A meeting for the promotion of Mr. Fuller's tontine and art-union association scheme for the establishment of the people's palace in the north of London, has been held at Wood-green. Mr. Fuller explained his proposal, of which we have before spoken, and Mr. Scott Russell and he explained how they, in association with Mr. Cole, C.B., assisted the Prince Consort in establishing the '51 Exhibition, and its building, which Mr. Fuller and Mr. Russell also managed, with a few others, to have re-erected at Sydenham. It was finally resolved—"That this meeting, having heard the plan proposed by Mr. F. Fuller, for opening the Alexandra Park and Palace, hereby declare its opinion that the project is practicable and well worthy of adoption, and request those gentlemen who shall enter their names as subscribers for shares, to act as a Wood-green Committee for carrying out the proposed scheme." The capital proposed to purchase and complete the building ready for opening is 605,000*l.*: too large a sum.

Rochester New Corn Exchange.—The corner stone of a new Corn Exchange has been laid by the mayor, who subsequently opened the Castle grounds, which had been acquired on a long lease from Lord Jersey, to be formed into a recreation-ground for the use of the citizens. The corporation take charge of the Castle and grounds, and will bear the expense of maintaining them in order; but the cost of laying out the grounds—2,000*l.* or more—will be met by public subscription, a large sum having been already promised. The new Corn Exchange, a large building, is being erected in the rear of the present Corn Exchange, which will serve as an approach from the High-street to the new building. There is no opportunity for effective display on the exterior of the new building, from its situation; but the great hall in the interior will be a fine one, while in other parts there will be a library and a variety of offices. It will cost 5,000*l.* or more.

Free Library and Museum, Middlesbrough.—At a meeting of secretaries and other representatives of various lodges and trade societies in the town of Middlesbrough, the following resolution was carried unanimously:—

"That this meeting heartily approves of the proposed free public lending and reference libraries, newsroom, and museum, and that the representatives of the various societies here present agree to bring the subject before their respective members at an early date, in order to ascertain their feelings and wishes on the question, and that they will report the same to the chairman of this meeting."

Gift of a Marble Statue to Hull.—At a meeting of a sub-committee to decide as to the position to be occupied by the marble statue which Mr. Sheriff Leetham has promised to present to the town of Hull, one of the niches in the porch of the Town-hall has been fixed upon. The work of preparing the statue has been given to Mr. W. D. Keyworth, jun., of Hull and London. The statue will be one of Michael de la Pole, first Earl of Suffolk, and Lord Chancellor, son of Sir William de la Pole, whose statue already adorns the Town-hall.

Working Men's College, Great Ormond-street.—The new term has commenced, and the men are at work again. The programme of Art Classes shows the following arrangement:—Monday and Friday—Life class: visitors, Mr. Lowes Dickenson and Mr. W. Cave Thomas. Monday — Antique class: teacher, Mr. Cave Thomas. The Elementary classes are: — Tuesday — Pencil and chalk; Thursday — Water colour, Mr. G. Rosenthal. Wednesday — Ornament and Perspective class, Mr. W. H. Brewer. We hope to hear of a large number of members joining.

The late Mr. Edward Cresy.—We hear with great regret of the premature death of this gentleman, who was principal assistant clerk at the Metropolitan Board of Works, and architect to the Fire Brigade. The various buildings lately put up for the Brigade were erected from his designs. He was private secretary to the late chairman, Sir John Thwaites, and did good service. His father was well known in the profession, especially by his "architectural antiquities of Rome," published in conjunction with Mr. G. L. Taylor.

TENDERS.

For alteration of beer-vaults in Waterloo-road, Burslem. Mr. W. Eisby, architect:—

Bennett & Cooke	£432 0 0
Sidley	405 0 0
Brindley & Critchlow	389 0 0
Hall	335 0 0
Sambrook	260 0 0

For alterations and additions to Guildhall and Assize Courts, Swansea. Mr. C. J. Phipps, architect. Quantities by Mr. Tasker:—

Morgan	£3,750 0 0
Williams	3,507 0 0
T. Rees	3,189 0 0
Thomas, Watkins, & Jenkins	3,100 0 0
J. C. Rees	2,945 0 0
White	2,750 0 0
Everal (accepted)	2,675 0 0

For completing six houses, Berridge-road, Gipsy-hill, Norwood, for Mr. James Lord. Mr. H. A. Alexander, architect:—

Waterer	£1,250 0 0
Potter & Ferrige	1,250 0 0
W. H. & J. Mansbridge	1,200 0 0
Parker	1,000 0 0

For the erection of Welsh Congregational Chapel, Shirland-road, Paddington. Mr. P. Wilkinson, architect:—

Brass	£2,913 0 0
Richards	2,717 0 0
Temple & Forster	2,565 0 0
Ebbs & Sons	2,423 0 0
Thompson & Smith	2,337 0 0

For stable buildings, enclosure walls, &c., Dudley House, Nightingale-lane, Clapham, for Mr. H. C. Green. Mr. R. P. Notley, architect:—

Maxwell & Sons	£997 0 0
Notley	919 10 0
Eaton & Chapman (accepted)	899 0 0

For lodge at Egham, Surrey, for Mr. J. K. Farlow Mr. R. P. Notley, architect:—

Oades (accepted)	£425 0 0

For the erection of a villa residence at Hampstead, for Mr. J. Harvey. Mr. W. A. Dixon, architect:—

Eston & Chapman	£3,698 0 0
Higgs	3,642 0 0
Manley & Rogers	3,557 0 0
Mann	3,455 0 0
Henshaw	3,365 0 0
Wicks, Bangs, & Co.	3,290 0 0

For erection of church, schools, and house, Skinner-street, Bishopsgate-street, for the inhabitants of St. Botolph, Bishopsgate. Mr. E. N. Clifton, architect:—

Simpson	£6,639 0 0
Jackson & Shaw	6,620 0 0
I'Anson	6,485 0 0
Ashby & Sons	6,465 0 0
Conder	6,191 0 0
Pritchard	6,187 0 0
Henshaw	5,952 0 0
Brass (accepted)	5,820 0 0

For extension and alteration to premises, connected with the Goose-gate estate, for Messrs. W. Wright and Others. Mr. J. Collyer, architect:—

Vickers	£500 0 0
Hackett	476 10 0
Shepperson	434 0 0
Andrews (accepted)	426 0 0

For the erection of premises, Nos. 4 and 7, Hart-street, for the City of London Property Company. Mr. A. B. Crockett, architect. Quantities supplied by Mr. Cubitt Nicholls:—

Turner	£2,474 0 0
Trollope	2,170 0 0
Hill & Keddell	2,160 0 0
Coleman	2,150 0 0
Myers	2,148 0 0
King & Sons	2,067 0 0
Macey	2,059 0 0
Newman & Mann	2,047 0 0
Rider	1,930 0 0
Ashby & Horner	1,930 0 0
Brass	1,883 0 0
Conder	1,750 0 0

For dwelling-house and shop at Caterham, Surrey, for Mr. Woollett. Mr. R. Martin, architect. Quantities supplied by Mr. F. Sparrow:—

Scrivener	£633 0 0
Brown	575 6 4
Hunter	560 0 0
Jarrett	546 0 0
Ward	535 0 0

For rebuilding warehouse, 106 and 107, Shoe-lane, for Messrs. J. & B. Dellagana. Mr. R. Parkinson, architect:—

Anley (accepted)	£3,020 0 0

For a warehouse, to be built in Old Swan-lane, Upper Thames-street, City. Mr. H. R. Abraham, architect. Quantities by Mr. Pether:—

Myers & Sons	£1,969 0 0
Browne & Robinson	1,900 0 0
Holland & Hannen	1,884 0 0
Merritt & Ashby	1,797 0 0

For Waterworks at Kidderminster:—

Goodman & Burton	£5,146 0 0?
Dixon	3,630 0 0
Everal	3,585 0 0
Hilton (accepted)	2,850 0 0?

For Croydon Cemetery. Mr. Baldwin Latham, engineer:—

Stevens	£2,330 0 0
Dickinson & Oliver	2,140 0 0
Anderson & Dunmore	1,788 0 0
Cole	1,780 0 0
Wright	1,515 0 0

For rebuilding premises, No. 19, Albert-terrace, Knightsbridge. Mr. Dudley, architect:—

Soyer	£1,352 0 0
Rudkin	1,324 0 0
Hockley	1,285 0 0
By-h	1,261 0 0
Turrel	1,247 0 0
Blackman & Morley	1,223 0 0
Polson	1,196 0 0
Scrivener & White	1,194 0 0
Snowball	1,157 0 0
Shillitto	1,135 0 0
Basham, Brothers	1,115 0 0
Tiley	1,100 0 0
Perry	1,024 0 0
Gough	991 0 0
Hurst	957 0 0

For villa residence, Waverley-street, Nottingham, for Mr. J. A. Howitt. Mr. J. Collyer, architect:—

Ward	£1,238 0 0
Marriott & Co.	1,230 0 0
Acton	1,220 0 0
Lynam	1,210 0 0
Curtis	1,205 0 0
Bell & Son	1,199 0 0
Barker	1,195 0 0
Vickers	1,169 0 0
Slim (accepted)	1,125 0 0

For house at Lenton, for Mr. J. Thorpe. Mr. J. Collyer, architect:—

Marshall	£342 0 0
Smith	396 18 0
Priestley	383 0 0
Attenborrow	380 0 0
Jelley	360 0 0
Vickers	370 0 0
Slim (accepted)	361 0 0

For house and business premises, Park-row, and Derby-road, for Mr. Bellaby, dentist. Mr. J. Collyer, architect:—

Sedgwick	£1,080 0 0
Johnson	1,070 0 0
Ward	1,067 10 0
Marriott & Co.	1,060 0 0
Attenborrow	1,040 10 0
Underwood	1,039 0 0
Bell & Son	1,034 0 0
Vickers	1,030 0 0
Jelley	991 10 0
Slim	984 0 0
Andrews	966 0 0
Marshall (accepted)	954 0 0

For alterations and additions for warehouses at Bedford-street, Covent Garden, for Mr. F. Dangerfield. Mr. A. Cross, architect. Quantities furnished:—

Patman & Fotheringham	£3,168 0 0
Colls & Son	2,978 0 0
Kelly, Brothers	2,943 0 0
Newman & Mann	2,926 0 0
Clemence	2,897 0 0
Howard & Co.	2,647 0 0

For alterations and additions to warehouse at Bedford-street, Covent Garden, for Mr. C. Hodgson. Mr. A. Cross, architect. Quantities furnished:—

Newman & Mann	£1,235 0 0
Patman & Fotheringham	1,228 0 0
Kelly, Brothers	1,147 0 0
Colls & Sons	1,135 0 0
Howard & Co.	1,038 0 0
Clemence	992 0 0

For addition at No. 38, Bedford-street, Covent Garden, for Mr. W. Berrad. Mr. A. Cross, architect :—

Thompson	£220	10	0
Clemence	213	0	0
Howard	212	0	0

SIR,—Allow us to state that our tender for works at Lewisham, as appeared in your issue of the 8th, did not include the works at Catford Bridge, and that there was nothing stated in the specification about that portion of the contract; therefore our tender was so much lower than any other.—J. & J. HAYNES.

TO CORRESPONDENTS.

J. C. T. (a notice was in type).—G. P. (declined with thanks).—D. B. (plans not yet received).—G. T. (we believe it to be a good material). — J. P. S. — C. L. E. — F. W. M. — R. P. N.—K. L. M.—F. Z.—J. F. — J. H. H. — C. F. — W. B. & Co. — J. J.—J. W.—B.—G. S.—G. T.—A. G. H. — A. E. O. — J. W. N. — L. & M. — R. W. J.—W. D. G. — J. T. — J. M. — C. H. G. — Sir J. W.—J. C.—C. H. S.—R. P. W.—A. C.—C. F. H.—Mr. N.

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NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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(Signed) J. M. DRAGO,
Treasurer of the National Government.
JOSE TOMAS ROJO.
JUAN M. ALVAREZ.

A true Copy.—A. M. BELL."

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WM. THOS. MANCLARE, Town Clerk.

Town Clerk's Office, Barrow-in-Furness, October 12, 1870.

COUNTY SURVEYORSHIPS (IRELAND.)—An open COMPETITION for the COUNTY SURVEYORSHIP of Westmeath, with a maximum salary of 400*l*. will be held in Dublin, in NOVEMBER next. The examination will extend over the four or five days commencing with November 8th, and the five days commencing with November 22nd, and will be in the following branches of knowledge :—

PART I.	Maximum of Marks.
Mathematics, including Geometry, Trigonometry, Algebra, Differential and Integral Calculus, and Geometrical Optics	100
Mechanical Philosophy, including Statics and Dynamics, Hydrostatics and Hydraulics, Pneumatics, and Heat regarded as a Source of Power	100
Experimental Science, including Inorganic Chemistry, Heat, Electricity, and Magnetism	100
Geology and Mineralogy	40
No Candidate will be eligible who does not show some proficiency under one at least of the heads included in Part I.	
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Dublin Castle, 4th October, 1870.

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CHAS. G. H. BECK, Town Clerk.

Town-hall, Blackburn, 19th October, 1870.

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ST. MARYLEBONE CEMETERY.—SUPERINTENDENT.—Notice is hereby given that the Burial Board will meet in the Board-room of the Court House, Marylebone-lane, on the 25th day of OCTOBER instant, at ELEVEN o'clock in the forenoon, to consider APPLICATIONS from persons desirous of becoming candidates for the Appointment of SUPERINTENDENT to the St. Marylebone Cemetery, situate at East-end, Finchley, at which time applicants must attend personally. The salary will be 100*l*. with residence. The applicant must be a married man, not less than 30 nor more than 45 years of age, accustomed to drainage and the laying out of grounds. He must understand gardening, be a good correspondent, and competent to take the general management of a cemetery. Applications, in the handwriting of the candidates, with testimonials as to character and experience, also statement of previous occupation, to be forwarded to the Clerk to the Board (of whom personal inquiries may be made as to the duties) on or before SATURDAY, the 22nd day of OCTOBER. A personal canvass of the members of the Board is strictly interdicted.—By order,

W. E. GREENWELL, Clerk to the Board.

Court House, October 7th, 1870.

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WANTED, EMPLOYMENT, by a respectable Young Man, as a GENERAL HAND in Jobbing Work, as Plumber, Glazier, Painter, and Zincworker. Is able, and will make himself generally useful in the general line of jobbing work, or anything else required. Wages 25s. per week.—Address, S. H. 72, Milton-street, Dorset-square, N.W.

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WANTED, by a practical and energetic MAN, a RE-ENGAGEMENT as OUT-DOOR or SHOP FOREMAN. Thoroughly understands drawings, setting-out work, and the management of men. Good references. Aged 38.—Address, H. J. S, Wharton-street, Lloyd-square, Clerkenwell.

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WANTED, by a first-rate GOTHIC DRAUGHTSMAN, a RE-ENGAGEMENT. Has a thorough knowledge of Perspective. First-class references.—Address, H. I. G. 30, Clipstone-street, Fitzroy-square, W.

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WANTED, by a PLUMBER, Hot-water and Bath Hand, a SITUATION. Good at painting and glazing.—Address, J. M. 4, Upper Rathbone-place, Middlesex Hospital.

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WANTED, by a thoroughly practical Man, an ENGAGEMENT as CLERK of WORKS or GENERAL FOREMAN. Has had many years' experience on first-class works, measuring, &c.—Address, W. H. K. care of Mr. Waghorn, 10, Vinegar-yard, Brydges-street, Covent-garden, W.C.

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WANTED, by a good PLUMBER, a SITUATION or JOB. Well up in all branches of the trade, having had several years' experience. Aged 43.—Address, 285, Office of "The Builder."

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WANTED, EMPLOYMENT, by a handy, steady Man. Understands the painting and glazing. No objection to anything else. Wages, 18s. per week.—Address, A. B. care of Mrs. Major, New Hampton, Middlesex.

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WANTED, by a Young Man, a RE-ENGAGEMENT as CLERK, &c. in a BUILDER'S or other Office. Thoroughly acquainted with the ordinary duties, having had several years' experience both in the above and heating. References to present employer.—Address, A. B. Post-office, Foubert's-place, Regent-street, W.

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TO ARCHITECTS, SURVEYORS, AND BUILDERS.

WANTED, by the Advertiser, a SITUATION. First-class general draughtsman, good knowledge of perspective, details, quantities, measuring up work, &c.; also land surveying. Very good references from present and former employers. No objection to go abroad, or would prepare drawings, &c. at own residence at moderate charges.—Address, ARCHITECT, Post-office, Norfolk-terrace, Bayswater, London.

TO BUILDERS, PLUMBERS, &c.

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WANTED, by a Young Architect, an ENGAGEMENT as ASSISTANT. Is well up in office routine, surveying, plans, detail drawings, &c. Salary not so much an object as employment in a first-class office.—Address, J. E. T. Bromley House, Nottingham.

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WANTED, a RE-ENGAGEMENT, as GENERAL FOREMAN or otherwise, by a Young Man, aged 24, acquainted with superintending a jobbing business, preparing plans and details, estimating, measuring up, keeping accounts, &c. Reference to present employer.—Address, A. B. 8, Forston-street, London, N.

TO ARCHITECTS AND SURVEYORS.

WANTED, a RE-ENGAGEMENT, by an ASSISTANT, who is competent to prepare working, detail, and perspective drawings, well versed in construction, &c. Eight years' and a half experience. Good references.—Address, S. E. 48, Foley-street, Portland-place, W.

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WANTED, an ENGAGEMENT, temporary or otherwise, by the Advertiser. Is a good draughtsman; well up in details and construction, taking out quantities, measuring up works, estimating, book-keeping, &c. Six years' reference to last employer. Aged 27.—Address, E. A 56, Ernest-street, Albany-street, Regent's Park.

WANTED, a RE-ENGAGEMENT, as FOREMAN of BRICKFIELD, or Contract to Dig, Make, and Burn. Good reference.—Address, G. R. B. care of Mr. Taylor Cotton Estate Office, Bow Common, London.

TO BUILDERS AND OTHERS.

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WANTED, a RE-ENGAGEMENT, as BUILDER'S FOREMAN, or to Superintend Works. Has had several years' experience in the above capacity and in the different branches of building. Can prepare drawings, measure up work, take off quantities and estimate. Carpenter and joiner by trade. Good references.—Address, T. J. Wycombe-road, Marlow, Bucks.

TO MASTER PLUMBERS AND BUILDERS.

WANTED, by the Advertiser, a SITUATION as PLUMBER, or THREE-BRANCH HAND. Town or country. Good references can be had.—Address, A. C. 12, Balham-street, Kempton-road, Camberwell Park, S.E.

WANTED, PLASTERING (Labour only), by a thoroughly practical PLASTERER, town or country, or as WORKING FOREMAN of PLASTERERS.—Address, G. A. 3, St. John's-road, South Norwood, S.E.

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TO BUILDERS, HOUSE DECORATORS, HOUSE AGENTS, &c.

WANTED, by a Young Man, aged 30, a RE-ENGAGEMENT as FOREMAN, or to Take Charge of a Business. Well up in measuring, &c. Good experience in writing, graining, and decorating. First-class testimonials from the West-end. Specimens of workmanship can be shown.—Address, F. B. 20, Caledonia-terrace, King's road, Chelsea.

TO BRICK AND TILE MAKERS.

WANTED, a SITUATION, as MANAGER or YARD FOREMAN, by a thoroughly practical Man, of many years' experience, or would be willing to invest 500l. with a view to PARTNERSHIP.—Address, B. B. Post-office, High-street, Tunbridge Wells.

TO BUILDERS AND CONTRACTORS.

WANTED, PLASTERING (piece-work), by a practical Man, and well experienced in taking plastering to any amount. Town or country. Labour only.—Address, 254, Office of "The Builder."

WANTED, by a practical JOINER, a RE-ENGAGEMENT as WORKING SHOP FOREMAN of JOINERS, or to Take Charge of a Job. Age 35. Undeniable reference.—Address, A. P. No. 30, Netley-street, Hampstead road.

WANTED, an ENGAGEMENT as SHOP FOREMAN of JOINERS, or as General Foreman. The Advertiser was for some time foreman to a manufacturing joiner in London. No objection to the country.—Address, A. B, 64, High-street, Portland-town, N.W.

WANTED, by a practical Young Man, aged 21, a SITUATION as CARPENTER and JOINER. Wages not so much an object as a constant situation.—Address, H. H. 275, New Kent-road, S.E.

TO PLUMBERS, BUILDERS, &c.

WANTED, by a PAINTER and GLAZIER, EMPLOYMENT as IMPROVER to the PLUMBING for Six Months. No objection to fill up time at painting. Wages 15s. per week.—Address, C. J. 26, Hanover-place, Kennington Park-road.

TO BUILDERS AND CONTRACTORS.

WANTED, by a practical CARPENTER and JOINER, PIECE-WORK, In or Outside Work, or Fixing.—Address, T. W. 58, Union-street, St. Pancras, N.W.

TO BUILDERS AND CONTRACTORS.

WANTED, by a practical London OUT-DOOR FOREMAN, a RE-ENGAGEMENT. Carpenter and Joiner by trade. Good testimonials from London builders. Aged 35. Town or country.—Address, T 3, Hill-street, Finsbury.

TO BUILDERS, &c.

WANTED, a RE-ENGAGEMENT, as BUILDER'S CLERK. Aged 25. Has served some time at the practical part, used to measure up work, quick at figures, used to office routine, and good draughtsman. First-class personal reference.—Address, S. N. B. 58, Albany street, Regent's Park, N.W.

TO BUILDERS AND MASTER PAINTERS.

WANTED, an ENGAGEMENT, by an experienced Man, aged 27, as PAINTER and GLAZIER. Can turn his hand to paper hanging, if required. Wages 25s. per week.—Address, C. B. 161, Weedington-road, Kentish-town, N.W.

TO BUILDERS.

WANTED, a SITUATION, as FOREMAN of CARPENTERS, or to SUPERINTEND GENERAL WORKS, by a thoroughly practical Man. Town or country. Good references can be given.—Address, A. B. 42, Moray-road East, Finsbury-park, Holloway, N.

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THE Advertiser seeks an ENGAGEMENT with the above. Has a thorough knowledge of building construction and is a good judge of Timber. Any capacity.—Address, 288, Post-office, Paddock, sevenoaks.

TO BUILDERS, &c.

THE Advertiser wishes for an ENGAGEMENT, either as SHOP or OUT-DOOR FOREMAN. Has had good experience in the management of all branches of the building trade. A carpenter by trade.—Address, J. E. 56, Glyn-street, Vauxhall-gardens.

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THE Advertiser, aged 49, who has for sixteen years had the charge of railway contractors' books, wishes an ENGAGEMENT, either for whole time or for four days per week. First-class references. Security, if required.—Address, PERSEVERANCE, 21 Deacon's, Leadenhall-street.

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THE Advertiser desires EVENING EMPLOYMENT. Good draughtsman. Quantities and accounts. Apply, A. B 6, Buck-street, Camden-town, N.W.

THE Advertiser, who understands Levelling, Surveying, Preparing Drawings, &c. desires a SITUATION. Small salary for a permanency.—Address, FORTUNE, care of Mr. Chapman, Wingfield, near Alfreton, Derbyshire.

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THE Advertiser, aged 36, wishes to meet with a permanent ENGAGEMENT, or Job as Plumber. Has had charge of heavy and important jobs, both in Town and country. Is experienced in all its branches, including bath, pump, closet, and outside work. Good reference.—Address, A. B. 1, Spencer-street, Bridge-road, Battersea, S.W.

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THE Advertiser, who can be strongly recommended, seeks an ENGAGEMENT as JUNIOR ASSISTANT. Address, E. N. S. care of Messrs. Knight & Co. Fleet-street, London.

TEMPORARY ASSISTANCE.—A Surveyor of great experience in Measuring, Estimating, and Quantities, will be glad to give TEMPORARY ASSISTANCE. Has had great practical experience in taking and arranging extras and omissions. Would undertake the books and accounts of a Builder. Address, SURVEYOR, 11, Duke-street, Portland-place, London, W.

TO BUILDERS, CONTRACTORS, &c.

SITUATION WANTED, by a practically experienced Man. Thoroughly understands taking out quantities, drawings, specifications, estimates, and prime cost. Good accountant, and the highest testimonials. Salary, 2l. 2s.—Address, W. 105, Caledonian-road, N.

OCCASIONAL ASSISTANCE.—The Advertiser, who has had extensive experience in first-class builders' and surveyors' offices, is prepared to undertake the MEASUREMENT of WORK or the Preparation of Drawings and Bills of Quantities, at his own or other offices, on moderate terms. Address, 275, Office of "The Builder."

TO ARCHITECTS AND SURVEYORS.

OCCASIONAL ASSISTANCE rendered by the Advertiser, of many years' experience.—Address, 289, Office of "The Builder."

FOREMAN of MASONS.—WANTED, a RE-ENGAGEMENT as the above, ornamental or public. Town or country. Good references.—Address, A. B. 131, Lupus-street, Pimlico, S.W.

EMPLOYMENT WANTED, by a good CARPENTER and JOINER 5l will be given by the Advertiser to any one procuring him a good job. In confidence, address, No. 272, Office of "The Builder."

TO BUILDERS, SURVEYORS, AND OTHERS.

A YOUNG Man, 27, seeks an ENGAGEMENT. Can take out quantities, bill, and abstract; trace accurately, with a knowledge of drawing; keep prime cost and other accounts.—Address, A. S. Furnival's-inn-place, Holborn, E.C.

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A GOOD and expeditious DRAUGHTSMAN, who is perfectly capable of getting up working and finished drawings, perspectives, &c. is a good colourist, and understands the routine of an office, is desirous of meeting with an ENGAGEMENT. Terms moderate.—Address, C. R. 22, Wharton-street, W.C.

AN ESTIMATING and MEASURING CLERK, thoroughly qualified, great practical experience, and used to extensive works, requires an ENGAGEMENT. Well versed in accounts, and the duties of a Builder's and Contractor's Office. First-class testimonials and references.—Address, M. F. 14, Clarence-street, Islington, N.

AS CHAINLEADER, or to take the Level Staff. EMPLOYMENT WANTED, by a steady intelligent Man, who has had several years' experience. Half a crown per day. Address, R. W. W. Post-office, 186, Fulham-road, S.W.

A YOUNG MAN, who has served an Articleship of three years under a London Surveyor, and who has since had charge of various works connected with drainage, wishes to enter into an ENGAGEMENT, for a stated period, in the office of a Civil Engineer and Surveyor of good standing, where his services would be considered partly equivalent to the additional experience he would acquire.—Address, J. C. Mr. Coates's, High-street, Hampstead, N.W.

A CARPENTER and JOINER having had ten years' experience in London, wishes for a permanent SITUATION, either Town or country. Good references.—Address, 226, Office of "The Builder."

A YOUNG ARCHITECT, who has practised for the last three years (chiefly church restorations, parsonage and school houses) having no fresh work, wishes for an ENGAGEMENT in an Architect's Office.—Address, ARCHITECT, 48, Albany-street, Regent's Park, N.W.

TO ARCHITECTS AND SURVEYORS.

A FIRST-CLASS general ASSISTANT desires a RE-ENGAGEMENT, temporary or otherwise, in a London office. Terms moderate.—Address, A. C. 1, Dunlace-road, Lower Clapton.

TO ARCHITECTS.

AN ASSISTANT wishes an ENGAGEMENT. General practice.—Address, R. SMITH, care of T. Nalder, 53, St. Michael's-hill, Bristol.

AN experienced ARCHITECT'S ASSISTANT (married) is open to an ENGAGEMENT. For nearly two years has been wholly employed, at his own residence, by a country architect, to whom reference is permitted. — Address, ARCHITECT, 45, Cowper-road, Stoke Newington.

TO SURVEYORS, BUILDERS, CONTRACTORS, &c.

A THOROUGHLY practical, experienced Man, well accustomed to specifications, drawings, setting out work, prime cost, and estimating, desires a SITUATION as MANAGING CLERK, Cashier, or General Foreman.—Address, W. 1, Suffolk Villa, Holmesdale-road, Norwood, S.E.

ARCHITECT'S ASSISTANT.—A Gentleman (aged 21) seeks an ENGAGEMENT as above at a small salary. Seven years' experience in first-class offices.—Address, G. CUTHBERT, 21, Whitehall-place, S.W.

A DRAUGHTSMAN WANTED, in an ENGINEER'S and SURVEYOR'S office, situate in a town twenty miles from London. State how last employed, salary required, &c.—Address, ENGINEER, 30A, King William-street, London.

TO DECORATORS, &c.

A COMPETENT GRAINER, MARBLER, and WRITER desires an ENGAGEMENT. Can do plain, ornamental or perspective writing. Terms moderate. No objection to fill up time at painting.—Address, C. T. W. 205 Lancaster-road, Notting-hill, W.

TO ARCHITECTS.

A THOROUGHLY competent ASSISTANT desires an ENGAGEMENT.—Address, L. M. 10, Oakley-crescent, Chelsea.

AN efficient ARCHITECT and SURVEYOR'S ASSISTANT is open to an ENGAGEMENT.—Address, 250, Office of "The Builder."

The Builder.

VOL. XXVIII.—No. 1447.

Settlement of the Sewage Question.

IT is high time that the sewage question should be settled. The subject is one of extreme importance, both from a sanitary and from an economical point of view. It is one which it is not especially pleasant to discuss. Pressing, with more or less incidence, on each of us, it yet involves considerations which are hardly suited for ordinary conversation. From this natural disinclination to making use of the ordinary modes of collecting and diffusing information, additional obscurity is thrown upon a subject beset with chemical and with mechanical difficulties. Men who have studied the subject are apt, unless they are unusually reticent, to be regarded as bores. Thus the information which has actually been collected is, so to speak, stored up in tanks, instead of being allowed to filter through the public mind, and to leaven that mass of ignorance which is dignified by the name of public opinion.

In this, as in all other so-called "questions," the first requisite is to arrive at the knowledge of actual facts. Facts, duly collected, and duly assorted, are the great foes of "questions." They exterminate discussion. They have an aptitude for arranging themselves under the form of laws. But facts picked up here and there, in order to supply weapons for argument, or props for foregone conclusions, are among the most dangerous sources of error. The light which, bearing on a well-known beacon, assures safety to the mariner, who knows its true bearings on his course, may lure the ignorant and unwary to shipwreck.

The object, therefore, at which it is essential to aim in this matter, is the appreciation of the actual facts which we have learned from the chemical and mechanical investigations of the last quarter of a century. They must be regarded not as isolated phenomena, but as a whole. They must be weighed, not according to their harmony with this or that pet hypothesis, or foregone conclusion, but as forming a special body of scientific information. When we thus investigate what is actually known, we soon find where our science is limited. We know in what direction to seek for further light; and we are in a position to tell whether the time for action has arrived, or whether wisdom commands us to await the results of further investigation. To that great body of our readers whose professional duties or habitual studies lead them to deal with the important questions of sanitary precautions, of town building, or of scientific, that is to say, of intelligent, farming, we think that it will be a matter of no small satisfaction to find how very nearly the great "Sewage Question," as we showed in our last issue, has really ceased to be a question at all.

To the historic part of the subject it is hardly necessary for us to return. It must be familiar to our readers. To commence by a review of the instructive cleanliness of the domestic cat, and to draw a parallel between the very praiseworthy habit of that animal and the detailed injunction of the great Jewish lawgiver, is not our purpose now. Years have passed since these illustrations, now public property, were first brought forward in our pages. Neither is it necessary to withdraw the decorous veil which the good taste of the printer's devil draws over the notes of those travellers who speak of Continental abominations. It is, happily, unnecessary to give any detail of the establishment and worship of filth in Portugal, in Southern Italy, in the country districts of France; or even to cite the venerable but ever commanding testimony of the author of "Waverley" as to the dangers of the nocturnal wanderer in the streets of Auld Reekie. The first procedure of nascent civilisation, whether it be a step in advance or no, in providing a special locality for refuse matter, has been long since passed under review. Midden heaps, stagnant ditches, open cesspools, heaps in cellars, covered cesspools, and tunnel middens, are known to be so many seed plots of typhoid fever and of cholera.

The lowering of the death-rate in towns where works and regulations destined to promote public health by promoting personal purity have been carried out, is a fact placed in evidence by the medical officer of the Privy Council. In twenty-five towns thus taken in hand the death-rate has been lowered in almost every case, and in many instances considerably so. At Cardiff it has been reduced from 33·2 per mille to 22·6 per mille. At Newport a similar reduction has been effected. At Merthyr Tydfil the reduction has been at the rate of 21 per cent.; at Macclesfield, 20 per cent.; at Croydon, the like amount. These figures refer to the general mortality. If we look to the special causes of death which are fostered into a virulent activity by neglected drainage and sewerage, we find that in nine towns the diminution in the number of deaths from typhoid fever has exceeded one-half, and in the remaining towns it has been between one-third and one-half; Bristol, with a reduction of 33 per cent., standing at the bottom of the list, and Salisbury heading the count with a reduction of 75 per cent.

In the case of epidemic cholera, the effect of proper sanitary measures is actually that of "stamping out" the pest. Merthyr Tydfil presents a very striking example. During the epidemic of 1848-49, cholera carried off 267 persons out of 10,000. During that of 1866 the number of deaths did not exceed 20 out of 10,000. Salisbury descended from a mortality of 180 to one of 14. Alnwick, from 205 to *nil*. Reduction in the number of deaths by cholera from sanitary works is not only a general rule, but a rule with no exception.

In the case of some other of the most obnoxious diseases that afflict mankind, the indirect influence of sanitary works in properly draining the subsoil has perhaps been more valuable than their direct effect. Phthisis has been diminished, in a more or less considerable degree, in consequence of the drying of the soil which has, in most cases, accompanied the laying of main sewers in the improved towns. In Salisbury, Ely, Rugby, Banbury, and other towns, where the drying of the subsoil has been considerable, the deaths from consumption have ben reduced by from one-third to one-half of their number. In Leicester, where there was a great reduction in the subsoil water during the time the sewage works were in progress, the death-rate by phthisis subsided by 41 per cent. of its previous amount at all ages, and by 32 per cent. from the death-rate of females at the middle age of life. With a rise in the subsoil water since the completion of the works, the phthisis death-rate has again somewhat risen, although it still remains far below its former amount. But in cases where impervious pipe sewers alone have been introduced, and where no alteration has been made in the level of the subsoil water, no decrease in phthisis has taken place. It must be remembered that the removal of the predisposing causes to any particular form of disease may cause the tendency of increasing the proportionate activity of other disorders, inasmuch as it leaves a greater number of the feebler members of the population exposed to attack.

It is not only health and long life that are attendants on the work of the sanitary engineer, but, as we have a thousand times urged, decency, self-respect, and morality.

The influence of drainage, as distinct from sewerage, on the spread of phthisis is only one out of many facts that point to the duty of separating the works intended to remove the storm water and surplus rainfall from those properly belonging to the removal of refuse from the houses.

This part of the subject possesses an engineering importance of the first character, and it is one to which a proper degree of attention has been by no means yet directed. To the comparatively low and finely-distributed rainfall of the greater part of Great Britain it must be attributed, that we have hitherto been able to practise a false and deceptive economy in this respect. The sudden and hearty down-pour which comes upon our neighbours some ten degrees southward of our latitudes, is such as to demand adequate provisions for its discharge; and when southern cities make any attempt at sanitary engineering, they never complicate the subject by attempting to conduct a regular and an accidental flow of water through the same limited channels. Even in London we have, within the present year, found serious evil to result from that barbarous system of hydraulics. Its prevalence is, no doubt, a main reason that has led to the temporary failure of more than one attempt to apply the sewage of towns to the purposes of agriculture.

The seven water companies that supply London with water deliver through their mains the quantity of one hundred and seventy millions of metric tons in the course of the year, being at the rate of nearly thirty-two gallons per diem to each person. When we consider the absolute requirement of each person for purposes of food and of cleanliness, and remember how far the bath (even in its most convenient, and perhaps most refreshing, form of a sponge bath) is from being a universal requisite, it is pretty clear that nearly nine-tenths of the water supply must be mainly required for the service of the sewers. The dilution thus effected in their less limpid contents is upwards of a thousand per cent. For economic purposes this dilution is more questionable in its advantage than for sanitary purposes. Looking forward to the time when pumping will be requisite, in one locality or another, for all town sewage, it is clear that any undue or unnecessary dilution will cause a direct waste in the expenditure of steam power, and in the general magnitude and costliness of the hydraulic work, to say nothing (for the moment) as to the diminished value of the fluid.

Now a square mile, if covered with 24 in. of water (a low average rainfall) represents 1,728,000 metric tons. For the 122 square miles of the area of London (to say nothing of the much larger surface comprised within the surrounding watershed), this rainfall will therefore amount to 211,000,000 metric tons, or about 125 per cent. of the regular water supply. Thus for every four tons of ordinary discharge provision must be also made for five tons of extraordinary discharge. The first is spread over 365 days; the latter may be absent for three months, and then may come down, with a sudden energy, with the over-due supply, to make up

for loss of time. Economy, certitude, good order, all are set at nought by this combination of the regular and the irregular. The whole system of sewerage, including the pumping apparatus, may be suddenly called upon to perform thirty times its ordinary duty. The liability to such a sudden pressure must either involve enormous outlay, or present us with a system of drainage liable to break down whenever we are visited with a quasi-tropical shower. Nor does this view regard the abstractive part of the system alone. Its reproductive, or self-supporting, part (for to that we must steadily look) will be no less seriously deranged. If the effluent fluid was worth 2d. per ton in dry weather, it will be worth scarcely anything on the day of such a storm as we have not rarely witnessed.

It is thus evident that by our present almost universal system of turning the general rainfall into the sewers, we commit an offence against both sanitary and economical law. We pollute at the spring-head the courses of our rivers, diverting to this evil purpose the whole of the storm-water for which we make provision in our towns. We involve great outlay, great incertitude, and incompleteness of action, in those works of sanitary engineering which must, sooner or later, be undertaken by all towns and centres of population. And, in pervious soils, where the subterranean sewage, properly so called, must be carried in impervious conduits, to avoid contamination of the whole subterranean lake through which the drainage has to be led, we leave the district water-logged, and lose one important part of the sanitary benefits of drainage. At Chelmsford the separation of sewage and drainage is actually effected; the storm-water being carried off to the river by surface-channels and by superficial conduits, and the sewage being conveyed by pipe-drains to a pumping station at the lowest part of the town.

The system of water circulation, when once brought to comparative perfection, involves so much of what we may call wholesome luxury, is so conducive to health, and diminishes to so large an extent the amount of domestic labour (a matter which presses more heavily upon society from year to year) that no doubt can be entertained as to its future prevalence and general adoption. No other system will compare with it for a moment in these important characteristics. It is therefore sheer loss of time to give very minute attention to the subject of ash-closets, earth-closets, *fosses mobiles*, or any other less effective methods of keeping our houses sweet.

The destruction of fish, and the loss of one of the chief charms of rural life, by turning running streams into open sewers, are offences against social propriety under any aspect of the case. But when we consider how the germs of the most fatal diseases are thus scattered broadcast among the riverain population, there can be no room for doubt. Health, no less than comfort, bids us to imitate the process of organic life by keeping up a constant water circulation through our habitations. Health, and even safety, no less imperatively demand that we shall not, in so doing, poison the sources of our water supply. That we have done, and are doing, this to a considerable extent, there is not the shadow of a doubt.

The various processes that have been invented for the purpose of disinfecting the water which has served as scavenger to our great towns, before it returns to those natural channels by which it must alternately make its way to the sea, are many, and often are ingenious. One point to be borne in mind, as affecting this part of the subject, is, that we seek at the same time an æsthetic and an economical object, and that, in the pursuit, we have to contend with both mechanical and chemical difficulties. Taking the average diluted fluid which is produced, not for its own sake, but for the sake of cleanliness at home, the solid matters which we have to remove from it are partly mechanically suspended and partly chemically dissolved. Again, that which offends the nose is one thing, and that which endangers the life is another. It is possible entirely to remove the former, and yet to leave in the apparently pure and actually limpid water abundant germs of organic poison. The sulphuric acid, which imparts the most offensive character to animal refuse, forms about a sixth part of the solid ingredients. It is possible to lay hold, chemically, of this sulphuric acid (and, indeed, this is the chief object of the use of clay, alum, or other forms of alumina), without much affecting the organic matters, which amount to nearly one-half of the solids. Thus we have to regard both product and loss, to see what elements of agricultural value we can educe, and, at the same time, to test chemically the purity of the effluent water. Under this double test, bearing in mind that the chemical processes employed are limited as to cost, almost every empirical system has broken down. We have filtration processes, precipitation processes, an A B C process; we have employed lime; lime and chloride of iron; carbolates and sulphites of lime and magnesia; per-salts of iron alone; superphosphate of magnesia; sulphate of iron, lime, and coal-dust; crude sulphate of alumina; sulphate of alumina, sulphate of zinc, fine charcoal and slaked quick lime; alum, blood, clay, charcoal, and manganese; all without a satisfactory result. There has been no lack of money for experiment, and costly works have in some places been undertaken, but no such success has attended the efforts, as all would so gladly welcome if attained. At Leicester and at Blackburn the River Pollution Commissioners report the failure of the lime process; at Chelmsford filtering tanks have been abandoned; at Northampton the employment of the lime and chloride of iron process has entailed an injunction from Chancery in protection of the river Nen; at Croydon the use of per-salts of iron has been tried and abandoned; at Cheltenham Dr. Bird's process has been disused; at Leamington the A B C process is about to be given up. Regarding the double requisite of economical result and purification of water, failure stares us in the face.

It is highly satisfactory, however, to find that, after all, the most effective and reliable is also the most simple and natural procedure. The purifying nature of the earth itself, a fact which underlies such methods as those of Mr. Moule and Dr. Bird, is the one grand feature from which hope may be derived. Sewage water, if filtered through a sufficient depth of soil, loses both its suspended and its dissolved elements of evil, and leaves them in the proper condition, as the nutriment of vegetable life. The fact is, that we must no longer regard the disposition and treatment of sewage as a distinct engineering question. It is a portion of the theory and practice of scientific farming. It holds closely to the important and frightfully-neglected subject of irrigation. It affords the means of converting a waste of blown sand into a luxuriant garden. It is a matter requiring due care, adequate capital, and intelligent adjustment to the soil and conditions of each district of the country; but, these being given, the result is no longer problematical. Everywhere evidence may be collected to the same effect. The volume, by Mr. Corfield, just now published, under the authority of the committee appointed by the British Association,* will do much to remove any existing doubt as to the superiority of the irrigation system. Here are the conclusions at which the writer arrives, bearing out much that we have long persistingly urged:—

"(*a.*) That by careful and well-conducted sewage irrigation, especially with the application of small quantities per acre, the purification of the whole liquid refuse of a town is practically perfect, and has been ensured in cases where it was not at all the object of the agriculturist; and that it is the only process known by which that purification can be effected on a large or small scale.

(*b.*) That by it the value of land is enormously increased—at least doubled in every instance. That perfectly worthless land, blowing sea-sand for instance, can be made in this way to support large and valuable crops.

(*c.*) That the quantity per acre obtained from all crops is enormously increased.

(*d.*) That it reduces to a great extent, or entirely renders unnecessary, the usual amount of artificial manures of all kinds, by supplying a manure especially adapted, from its complex constitution, for the nourishment of crops, supplying it moreover in a state of solution, that is to say, in the most readily absorbable condition, and supplying at the same time that most necessary aid to vegetation, water, by which the value of the manure during the greater part of the year is almost doubled.

(*e.*) That by it the farmer is rendered almost entirely independent of the weather, so that he can be practically certain of his crops, and moreover be able to transplant them as much as he pleases.

(*f.*) That with all these advantages, it is no wonder that whenever sewage has not been wastefully applied, it has been found to pay; and that when its management is more thoroughly understood, it will doubtless be found to be a valuable source of income to the towns. In fact, in the words of the Rivers Pollution Commissions (1870), 'Intermittant filtration is a costly process with no possibility of any return; whilst irrigation, although it may in the first instance require a larger outlay of capital, affords a hopeful prospect of a return for the capital invested.'"

We recommend for a wide study the patient, candid, and ample digest of facts upon a momentous subject which has been drawn up by Mr. Corfield.

* "A Digest of Facts relating to the Treatment and Utilisation of Sewage." By W. H. Corfield, M.A. London: Macmillan & Co. 1870.

LONDON LOCAL GOVERNMENT.

If attention can be spared for awhile from the frightful aspect of foreign affairs to home matters, we would earnestly bespeak it in good time in favour of the proposed adjustment of our local difficulties, arising from the fact of our want of proper government for the Metropolis. Our home affairs are not happily quite so disorganised as they would be in a state of war; still even now they may be said often to present the appearance of a state of siege. At any rate, they continually exhibit conflicting elements nearly as disturbed as if produced at a period of revolution. And, indeed, the local government of London may be said to be in a revolutionary condition, or at least on the verge of being revolutionised, for we have the distinct promise of the Home Secretary that this subject shall be one of the first dealt with in the coming session.

If we can trust, too, the signs of the times: the distress of the Metropolitan Board of Works on losing their chairman, and the difficulty they seem to find in nominating a new one; the general objection to the expense and inefficiency of the present system, which daily appears in some shape or other; the want of confidence in vestry elections, as shown by the discussions of working men and others on the Education Bill; this business is ripe for legislation:—an important fact for Mr. Bruce, who has been careful in this, as in other matters, not to go too fast, but who may be now assured that the time for action is come.

Of more importance to a besieged city even than gunpowder, are food and the small individual necessities which go to make up existence, and so we may say of more importance to us here at home are the comparatively small details of daily occurrence than even the fall of cities and empires abroad, at least within the limited sense we wish to put upon the phrase. And it may not be inopportune when the cleanest and best cared-for city in the world is running the risk of passing away—perhaps into a mere heap of ruins—to learn the lesson which we might well have learned before, viz., how to clean and keep our city;—while in our turn we taught another, viz., how to economise our means and keep our local representative system at work without the necessity of imperial dictation and control.

Prudently to govern ourselves in such matters is indeed a worthy end and aim of a great community. Yet, strange to say, such domestic details are neglected; such local government as we have is decried, and things of home interest are only mentioned to be left alone to take care of themselves; while foreign or distant business is made all important; and this by a population priding itself on the practical character of its institutions, and its care of individual home interests. Naturally enough, therefore, complaints arise; but without going to the root of the evil, without an effort to provide the real remedy, all evaporate in noise or a newspaper letter full of grumbles. Not a week passes but the public, by one of its wrong-righters, or one who has felt the shoe pinch more sorely in his own case than others, complains in no measured terms of the chaotic state of our metropolitan domestic arrangements, or even of the deliberate mismanagement of vestries, boards, or offices of works. In fact, officials of all grades connected with our London Home Government, as it is facetiously termed, or "anarchy," as it has been described, have to bear the brunt of well-meaning but often narrow-drawn complaints; first as to streets wanting mending, then as to the sharp stones with which they are mended, anon as to the snow and slush which make them nearly impassable, and soon after that as to the dust and dirt which are not kept down by watering, and again, the slipperiness caused by the water-carts. The want of constant-service water supply for daily use or in case of fire, the daily robberies and calls for the police, and a host of other social questions, including cab regulations, street barriers, traffic obstructions, besides the more important main improvements of drainage, as to open places, &c.; all are the subjects of indignant articles in the public press; while, on the other hand, the outcry of ratepayers is becoming louder and louder, as the burden of local and metropolitan taxation increases more and more.

The worst of all this is its truth; and it needs no arguments to show that such complaints ought not to be well founded or incapable of remedy in a city which knows what real local

government ought to be, but which hesitates so strangely to agitate for the application of this to itself. Now we venture to say this is scarcely dignified, scarcely in accordance with the ordinary business habits of Englishmen, scarcely likely to lead to any good result, and certain not to remedy the abuses complained of.

What is wanted in the way of machinery already exists, however, and what is wanted in motive power is but latent. In the midst of much apathy, we are glad to acknowledge the activity and energy with which the Metropolitan Municipal Association have persistently urged this important question upon the public and its Parliamentary representatives. Some time ago we referred to the fact that the subject which, in 1868, dropped from the hands of Mr. Mill had been taken up by Mr. C. Buxton, and we noticed with pleasure the reception which a deputation of gentlemen, headed by Mr. Buxton, met with from Mr. Bruce, who spoke earnestly, and promised the early attention of the Government to Metropolitan Municipal Reform. A whole session of Parliament has passed since then; the way is cleared of a large accumulation of necessary legislation; and we have had indeed, as we said, a distinct promise of some practical result.

It is therefore with renewed hope and with earnest expectation that we call attention to the subject and to the remedies proposed, not with a view of expressing an opinion at this moment as to details, but to show the way which seems to promise the greatest likelihood of success. Already the three Bills introduced by Mr. Buxton have been considered and reported upon by the Metropolitan Board of Works and the City Corporation; so that whether the Government measure is to reproduce these, or to run in a different line, it will not be out of place to refer to them. One of these Bills provided for the formation of a series of nine municipal boroughs, to which were to be transferred, and in which were to be vested, all duties, powers, and properties, now exercised by the various vestries district Boards in London. Another provided for the absorption of the Metropolitan Board of Works in a new *Metropolitan Corporation of London*, composed of representatives from the various new boroughs, and of the present Corporation of the City. At the head was to be the Lord Mayor, although the present Court of Aldermen was to be extinguished, or nearly so, while the Chairman of the Metropolitan Board of Works was to become the Chairman of a Works Committee. Thus making a general amalgamation, or fusion of discordant elements into one general council, with one head and one jurisdiction over the whole metropolis, and thus vastly increasing the power and dignity of the ancient office of Lord Mayor of London. To this, at least, the City dignitary can but assent. A third Bill was for the formation of London into a county for police purposes, thus doing away with the absurd arrangements of one set of men inside and another outside Temple Bar, charged with the maintainence of order. The propriety of proceeding upon the lines marked out by common usage and consent is obvious; and if some reformation similar to the above plan is contemplated, we may congratulate ourselves on a scheme worthy of full and fair consideration.

At the same time great tact will be needed to carry any measure which really touches the evils to be remedied, for vested interests in abuses have grown strong; officials have been multiplied, to carry on what may better be done by fewer heads, and much compensation will have to be granted. Honorary posts, too, will have to be abolished, and great opportunity thereby afforded to vestrymen, and other local dignitaries, to show their public spirit, by voting for their own abolition. But the work is great, and personally as well as pecuniarily interesting to every householder and resident in the metropolis, for it involves all the business now carried on by the City Corporation, the Commissioners of Sewers, the Metropolitan Board of Works, and the innumerable smaller Boards throughout the metropolitan area, besides the business of those which otherwise would hereafter have to be created. Indeed, there are many matters now not even thought of by these existing authorities, which must in course of time be taken up by this new body. Even as the Metropolitan Board of Works has found business grow to its hand, and additional burdens placed upon its broad but still far too weak shoulders. For instance, what a relief would it be to our overworked Parliamentary legislators if they could escape the many discussions on petty details of London management, and our Home Secretary be saved from the difficulties of cab regulation, and of all thought as to tin flags and the like.

Our neglected squares, our sham monuments, and our useless fountains, would have some one responsible for their condition, and her Majesty's First Commissioner of Works would not be called upon to answer questions as to these or even perhaps might be saved from questions about Serpentine mud, or how not to rail in Regent's Park, inasmuch as no public parks or gardens need be left under Government control.

There are three good reasons why—three Ys—we should adopt some improved form of general metropolitan government, which in themselves seem to sum up the principal advantages to be gained, viz., Econom-y, Efficienc-y, and Humanit-y; in opposition to their three opposites, which rule in the present system, viz., Prodigalit-y, Inefficienc-y, and Cruelt-y.

The first,—Economy,—includes the saving of legislative power above referred to, as well as all the extra official labour now required, and the time of numerous local members which could be often much better employed in doing nothing. The opportunity for economies in expenditure, with larger areas, uniform system, better method, closer supervision, larger contracts, and constant use for plant and materials, is obvious. Also that of uniform system in rating, keeping accounts, scale of payments for salaries, and so on; while all this would as obviously lead to greater efficiency. No one would deny the immense waste of power in the multitude of local boards, and the difficulty of their working economically and efficiently, even when so disposed, from the restricted areas with which they have to deal and the involved arrangements required by the arbitrary form of the districts. Matters in this state, of necessity fall into the management of permanent officials. No one can stop the waste; no one insure efficiency.

But Humanity also calls, and the lost lives of both man and beast are often attributable to the present state of affairs. More certain sources of death are our London streets than the annual series of railway accidents, and yet no remedy is adopted, easy though it be. And the maiming and laming of animals is only too easy to be accounted for; yet nowhere is the simple remedy applied because of its cost, though it can be shown to be absolutely more economical to provide for the proper making of our streets than to leave them half finished as at present.

But one of the chief advantages of a proper local government for London, we think, would be the power of attracting the best men for its administration. The honour and the dignity conferred by being a member of the great council being worth contending for, we ought to have men of the highest ability ready and willing to give their attention to it as to the duties of the great council of the nation, and not as now, leaving local affairs entirely to local magnates and third-class dignitaries,—men who are honoured by the office rather than honouring the office they fill without adorning it. Already the Education Boards are taking a step in advance of Vestry Boards, nominating men of standing, men of education and experience, men — and, indeed, we may now add *women*—of large ideas, instead of men simply rising to the surface through the surge of local jealousies.

With such representatives, intent rather upon practical business than upon speech-making, we should hope to have a speedy settlement of the Hampstead Heath and similar questions as to open spaces. Economy would be promoted by an early consideration of the probable wants in certain localities, rather than by a long haggle over terms of purchase. With a powerful body, such as we may hope to see constituted, influential by personal, as well as by official position, there would be less chance of a scheme like the Embankment being marred by the petty tyranny of one department of Government, requiring a strong vote in Parliament to set it right; or of the vested interests in obstruction being able to prevent access to the roadway after it is formed; nor, again, would railway companies be able, let us hope, to defy the authorities east and west, and put up bridges and stations, air-holes and notice-boards, to the disfigurement of the localities and annoyance of every one, without interference or control.

One of the most important questions to be dealt with in a comprehensive manner is included under the head of traffic, comprising not only the lines of road and water way, and the removal of all obstructions to the circulation of the population, and the moveable part of their goods (such as private bars and barriers, toll-bridges, &c.), but also the vehicles themselves, which, whether they travel on land or water, are alike disgraceful in the present day. Why should such inert barges obstruct our river traffic as at present, and such shabby steamboats be allowed to bump against the new piers which have been carefully provided for their accommodation? and why should our cabs and omnibuses be deemed so incapable of improvement, when everywhere else they are better than in London?

These questions would soon be answered by a strong Government, representing London as a complete unity or community; while such a body would surely find means of passing through Parliament an improved Building Act, or add some important improvements to the present one. At the same time it would re-arrange the not unimportant matter of the appointment of district surveyors, so as to secure the services of the most able instead of the youngest and least known to the world for their ability. To the future builders of London this is likely to become a serious affair; but the thousand and one matters of a like nature which in some way or other affect architects, builders, and inhabitants alike, will demand serious consideration and impartial judgment when the expected measure shall be unfolded in the coming Session.

GAFF MUSIC AND THE OPERA.

To those thoroughly interested in the work and surroundings of the man Shakspeare, it must always be a matter of no small importance to find out, after the writing of his plays, what he did with them and how they were put upon the stage—such as that stage was. We have, in a previous number, endeavoured to give an idea, though a very faint and imperfect one, of the Globe Theatre; and we now propose to show, in part, what it was that that little inconvenient and weather-beaten house enshrined, as part and parcel of Shakspeare and his doings. Every portion of this world-famous little playhouse has been made matter of controvesy, and no part more so than its orchestra, where it was, what it was, how many performers in it, and what they did. It seems to be pretty generally admitted that they either stood on the floor of the stage itself, or occupied a little gallery immediately above and on one side of it, and probably on a level with the gallery, marked *e*, in the section of the Globe on p. 780, *ante*. It must always be borne in mind that the main idea of the architect or builder in the construction of the Globe playhouse was the common inn-yard of the time, with its gallery running all round it; and it may be that the gallery, *e*, was simply a continuation of the main gallery, *b b*, of the building, indeed just as though it had been an inn-yard octagonal on plan. In the inn-yards it is not unlikely that the "musicioners" were posted in this gallery, and it may have been so in the Globe, the stage being narrow and fully occupied by the actors themselves, and the select and privileged visitors. In one of the modern gaffs, where there has been some difficulty with the placing of the orchestra, a small gallery has been specially constructed for it, and from it half the necessary work of the show proceeds.

But if the position of the orchestra in Shakspeare's playhouse admits of doubt or controversy, much more so does that of the number and character of the performers, the instruments they piped on, and the character of the music they played. There are so many notices of music in Shakspeare's plays that there can be no sort of doubt as to the prominent position held by those who did the work of an orchestra in his day and playhouse. It is quite certain that they did a very important work, and were not allowed to spare their breath, for in addition to a volume of evidence we are told in a notice of a play acted at the Blackfriars in 1609, a year in which Shakspeare wrote one or more of his plays, that "when the ladies drew the curtains, the cornets and organs played loud and full music for the act." It is therefore certain that the music, whatever its character or kind, was a most important element in the performance of a play in Shakspeare's time, and that the attention and interest of the play-going public was kept up by the efforts of the orchestra. It is not a little important to bear this steadily in mind, for

in the modern gaff, the lineal descendant, as we contend, of the playhouse of Shakspeare, the musicians never leave the orchestra for a minute, and are perpetually in requisition. Indeed, unlike a theatre, a gaff could not sustain itself without the musical element, always ready for its special work in the way which we propose to explain. It is High Art in a gaff.

But first as to the kind of instruments used in a playhouse in Shakspeare's century. We are told that there were trumpets, cornets, hautboys, lutes, recorders, viols, and organs, and that probably there could not have been more than from eight to ten performers, if so many. What a curious thing it would be to see and hear the Globe orchestra. Did it make more or less noise than our improved men and instruments contrive to make? Did the trumpets outblow the rest of the instruments, or were they softened down to their more modest tone? What a pity it is that poor Shakspeare did not leave us a little account of the mode and manner of the performance, music and all, of one of his own plays; what a light it would have thrown on his plays, and his theatre, and himself. In *the* gaff of to-day, the ever-to-be-remembered and famous "City," the City of London Theatre, as it once was (it is now, alas! waiting for burial), the band consisted of some five performers,—a violin; a cornet-à-piston (no modern band could exist without this cornet); two drums, ingeniously played by one man,—*i.e.*, a small drum and a kettle-drum, with which positive wonders are to be done, when you know how; a flute; and a semi-grand pianoforte. As a contrast to a band of this kind, it may be mentioned that in another establishment the band consists wholly of brass instruments,—three cornets and two horns; while in yet one other, but somewhat smaller place, the orchestra is made up of a violin, a cornet, and a pianoforte. In mere numbers, therefore, Shakspeare would seem to have had the best of it. But the really vital and interesting question to us is, what did the band of musicians *do* in Skakspeare's day, and in his theatre, and what does the orchestra do in a modern gaff, as contrasted with what is done by the immense orchestra of Covent Garden, or the more modest band of an ordinary minor theatre? It is one of the most curious subjects connected with art and theatres and plays that can be well imagined, and we may confess at once that the gaff may stand or fall with it. How far our gaff friend Shakspeare can help us may be a little doubtful; but the "Globe" existed before the "City."

It is not a little difficult to make so new a subject as this duly intelligible to those who have not themselves gone through some troubles to come at it; for very many things have to be considered, some of quite an elementary nature, and others of no small difficulty, and open to not a little controversy. In an ordinary operatic performance at Covent Garden, it is well enough known that the musicians never leave the orchestra, and that the opera consists of overture, airs as they are called, accompanied words or recitative, songs, and choruses,—in short, as in the opera of operas, as it has been fitly named, Mozart's "Don Giovanni," the words of the play are conveyed to the audience through the medium of music; indeed, so magnificently creative and so dramatic is the instrumental music in it that the words spoken or sung are of quite a secondary and subordinate use, the wonderful music completely overpowers them, and no one cares much to know what it is that is said, or what the words mean, the whole story, and a capital one it is, notwithstanding what a modern writer says, is so wrought out and told by the marvellous power of the music. Mozart may well compare with Shakspeare in dramatic power; for, had he had any one of the great tragedies to illustrate with music, he must have divided with Shakspeare the glory of it, for his music would have done one half, at least, of the descriptive work; indeed, may we not say that the one would have negatived the other? the words might even have been lost in the stupendous musical accompaniment. Can you, then, some may ask, have anything too good? Impossible, may be the answer; but if at one and the same time and together, you may.

It is quite certain that Covent-garden opera and a gaff drama are at the very antipodes of artistic and social and human things, and that by no means could the opera audience be got to interest itself in the lower performance; but at the same time, be it observed, it would be equally impossible to catch the ear and keep the attention of a gaff audience in her Majesty's Opera House. Stupidity and ignorance! Not so, for the real reason, we can assure you, would be not deafness to the music, but from the fact of the rough audience not being able to make out what is going on or being said; the said audience demanding, first and before all things else, that all spoken words be quite clear and distinct, whatever they are or may pretend to mean. Now, this is going back to a very early and primitive way of doing things; and the question may well be asked, which manifests the highest perceptive powers, which is the most intelligent demand, the words of "Hamlet" or the music of "Don Giovanni," for you cannot have both at the same time. But the music is necessary to sustain and keep alive the dramatic interest; and, probably, in Shakspeare's day, and in the Globe playhouse, and certainly in the modern gaff, this is done, or at least attempted to be done, by a very simple and beautiful expedient: we say attempted, because, with means so slender and place so rough, we are sometimes obliged to take the will for the deed.

In Shakspeare's "Globe" and "Blackfriars," the band, in its gallery or elsewhere, certainly bore a most important part, for we are told that, before the play began, "three flourishes were played," or there were "three soundings," a phrase which seems to have puzzled some commentators not a little; by some it has been thought to indicate a sort of overture, as in an ordinary theatre; but may not the gaff system of doing things throw light on its real meaning? Of course, in the gaffs there is a little music from the band before the "piece" begins, but it has nothing to do with it, and does not in any way indicate its nature; but directly the curtain rises, and before the performer makes his appearance, or says anything, —just, indeed, as he is coming on,—some few bars of music are played by way of indicating his importance and the character of his part. In a genuine gaff this is repeated whenever a performer makes his appearance from the side, and whatever he may be, even if he be only a serving-man. Of course, the length and character of this simple sort of music differs according to the importance of the player, and the character of the part he takes, whether comic or tragic, and for the purpose of indicating it and of deepening the impression to be made. But more than this: not only is the great tragedian of the night ushered on to the stage by this preliminary outburst of music, but during the whole of his villain plottings, and tragic speeches, and pantomimic action in finding out the murder, or in the effort to commit one, a low strain of music is kept up, varied at intervals by louder bars, for the purpose of adding to and sustaining the dramatic interest, and of helping the actor in his work. The actual music is simple enough; but yet it is made at times not a little expressive of the action going on; indeed, becomes in a certain sense operatic; but with this important difference, that it is so subdued and subordinated to the words uttered, that it does not interfere with the words, or prevent their being perfectly and distinctly heard and understood. The impression caused by the uttered words of the play is simply sought to be deepened; but not, as in opera, nearly or quite blotted out by the musical accompaniment. The great defect of the opera is that the words and even action of the drama become altogether secondary and subordinate to the all-overwhelming instrumental music. In the last act of "Don Giovanni," so dramatic, and wonderful, and sustained, is the music, that the words are lost; the music does all the work, and Mozart has written the play over again in musical notes! But in gaff music this will not do. The audience want clear words, spoken words, and music simply to deepen or heighten their import, but not to smother them or even to compete with them. In an ordinary theatre no music seems, as a rule, to be needed during the actual performance; both action and talk go on without it, though it is occasionally introduced in modern melodrama. It is verily a great art problem in embrio, and is well worth cogitation, not to say an effort on the part of some gifted with the faculty of solving it practically; nay, we had almost said it is the highest of art problems, for if the highest of human faculties be, as we are told, the poetic, surely one equally high is, how best to *read* it to the world's ear. Opera smothers it outright; the ordinary theatre, as a rule, rejects help of sound; but the gaffs demand a something from the opera, but reject its overwhelming, or, as Shakspeare would have said, its gloomily overlooking power of sound. *When* this most beautiful idea of helping the impression made by clearly uttered words first arose it might be very difficult to say, but it seems certain that in the Globe and Blackfriars it was taken advantage of, at least partially. In a curious compilation written in 1609, Shakspeare yet living, Decker's "Guls Hornebooke," it is said, "Present not yourself on the stage until the quaking prologue hath by rubbing got colour into his cheeks, and is ready to give the trumpets their cue that he is upon the point to enter:" a clear indication that music, sometimes at least, preceded the entrance of an actor on the stage by way of preparing the audience for him and the part he had to play. If, therefore, the antiquity of the Globe play-house be a matter of interest to all who care about the man who has so immortalised it, must it not be a matter of no less interest as to what it was specially built for, and how the written plays of Shakspeare were put on the stage of the Globe "Gaff" and performed? Yet, more curious still, did Shakspeare write his plays with the idea that in the acting of them music would run along side by side with his charmed words? Or did those "groundlings" and "gallery commoners," who buy their sport for a penny, compel him to *play* them into humour; or, was it all left to these our modern days sinking down into the gutters from high opera; or, did opera itself rise out of it; or, did it indeed come of an older time when words were too few and weighty to be smothered even in the sweetest of sounds; or, last theory of all, Tribes of the Ragged! are you alone guilty of it, and living only for the passing hour, is it *you* only that ask for intelligible words out of an atmosphere of music?

A SERMON ARCHITECTURAL.

On the 2nd inst., on the opening of the Tron Church, Edinburgh, after the large east window had been filled with stained glass, as mentioned last week in our pages, the clergyman, the Rev. J. Macgregor, D.D., in the course of a sermon showing the propriety of adorning the House of God, made the following remarks:—

Although place and form can give no acceptability to worship,—although no virtue is added to the supplication of the humble petitioner at a throne of grace, because that supplication is uttered amid ascending incense and beneath a painted dome,—still, as in these latitudes at least, public assemblies can be held only within the shelter of roof and walls, our first point is that the place where men assemble for the worship of their Maker should, even in the matter of stone and lime, and much more in all the external aids of worship, serve the end they are designed to serve and be the very best which the worshippers can make them. While we rightly believe that the most tasteful architecture and the most chaste adornment cannot make the four walls of a building a house of God; that there is something of infinitely higher importance than painted windows and long-drawn aisles, we think wrongly if we think that these things are of no consequence at all. While I believe that there is no more virtue in a cathedral than in a barn, I believe at the same time that we can worship God better in a cathedral than in a barn. The Communion-wine would serve its end if passed round in an earthen vessel just as well as in a vessel of silver. The Communion-table would be as holy a Communion-table with bare boards as when covered with a snow-white linen cloth. Why do we use the one in preference to the other; but just because we feel that it is more appropriate, more becoming, more helpful to our own devotion, and more suitable to the service of our maker. On the very lowest ground it is surely a right and decorous thing to expend a little of that taste and wealth we pour forth so lavishly in decorating our private residences, in adorning that house where we are wont to assemble for prayer, where our fathers worshipped before us, and our children after us may worship when we are in our graves. The sentiment of David's heart should be that of every true man, "See now I dwell in an house of Cedar; but the ark of God dwelleth within curtains."

The nature which God has given us when not thwarted by silly prejudice or bigotry, craves for and prompts to the use of what is decorous and beautiful in the highest act in which man can be engaged—the worship of his Maker. Everything that can possibly tend to soothe, to solemnise, to elevate the mind, and bring it into harmony with the work of worship, should be